To: Jennifer Abernathy, NEPA Planner
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From: Karen Coulter, Director,
Blue Mountains Biodiversity Project
[redacted]

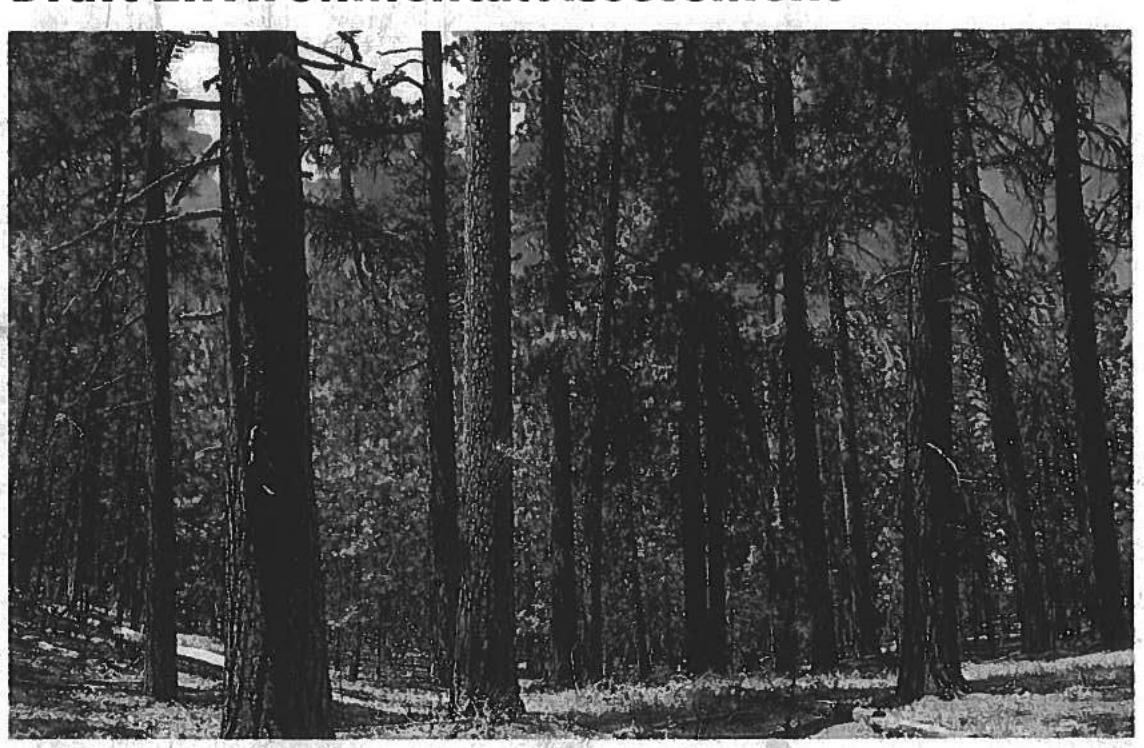
USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Region 6, Ochoco National Forest

Blue Mountains Biodiversity ~~Con~~ Project comments on:

North Fork Crooked River Forest Resilience Project

Draft Environmental Assessment



(*) Please note that I will be sending you a typed summary of most of our comments by email. I am mailing our handwritten comments so that you can see all of our comments, since I probably won't have enough time to type all of the comments. I will focus on typing some of the most significant comments and the comments hardest to read in handwritten form. I may add some additional comments in the typed version.

Thank you for your consideration of our comments.

For the Wild, Karen Coulter, Director,
Blue Mountains Biodiversity Project

(*) Our survey sheets & photo displays are part of our comments.

*Commercial logging of more mature and even large trees is not "restoration" when the area is already severely degraded from past logging and overgrazing by livestock. There are very few large trees compared to historical conditions and landscape scale scarcity of even mature trees between 15 and 21" dbh. While non-commercial thinning and prescribed burning could be helpful, heavy equipment use and mature and large tree removal would decimate wildlife habitat structure, forest resiliency, and carbon sequestration and storage in the sale area.

Chapter 1- Purpose and Need for Action

Introduction

We are proposing "landscape restoration" of about 11,000 acres of National Forest System lands on the Paulina Ranger District (District) of the Ochoco National Forest.

We prepared this environmental assessment to determine whether effects of the proposed activities may be significant enough to require preparation of an environmental impact statement. By preparing this environmental assessment, we are fulfilling agency policy and direction to comply with the National Environmental Policy Act (NEPA) and other relevant Federal laws and regulations. For more details of the proposed action, see the "Alternatives" section of this document.

This section of the document explains why we're proposing to take action in the North Fork Crooked River project area and summarizes the management direction that applies to our proposal.

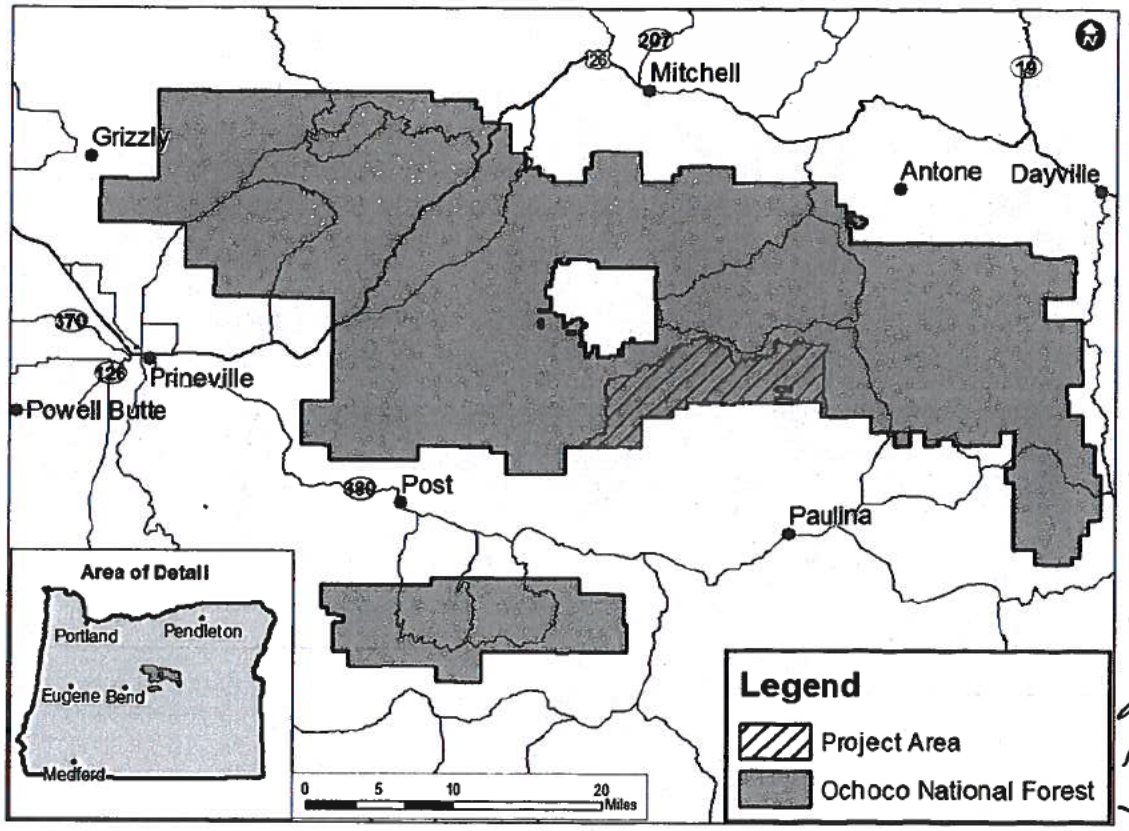


Figure 1. Project vicinity map.

The vicinity map shows that the project is located in the south-central area of the Ochoco National Forest. The project area totals about 37,577 acres and is located about 31 miles east of Prineville, Oregon, and 9 miles north of Paulina, Oregon (Figure 1). The project area encompasses the Lower North Fork Crooked River Watershed and the Paulina Creek Watershed.

The Wild and Scenic North Fork Crooked River bisects the planning area, winding through a mosaic landscape known as "scabland stringer," which includes stands of towering ponderosa pine and Douglas-fir

frequently found near streams or stream bottoms ("stringers") and expanses of exposed volcanic rock and thin soils with sparse vegetation ("scablands"). This patchwork of habitats support a variety of unique plants and wildlife, forage for grazing and offers numerous recreational opportunities for the residents and visitors of Central Oregon.

The fractured rock, steep slopes, thin and rocky soils provide a productive plant ecosystem in the scabland stringer and are home to some endemic plants. The mosaic scabland stringers provides edge habitats for wildlife species, including forage, cover and habitat connectivity for big game, small mammals, pollinators, songbirds, raptors, woodpeckers and more.

The project area contains a discontinuous forest, 46% (17,540 acres) is non-forested (scabland or juniper woodland) Figure 2. Activities in both alternatives is expected to improve habitat for antelope and sage grouse by reducing encroachment from surrounding forested areas. Reducing tree density along the scabland stringers will help to open the existing scablands and will help reinvigorate grasses, forbs and sagebrush.

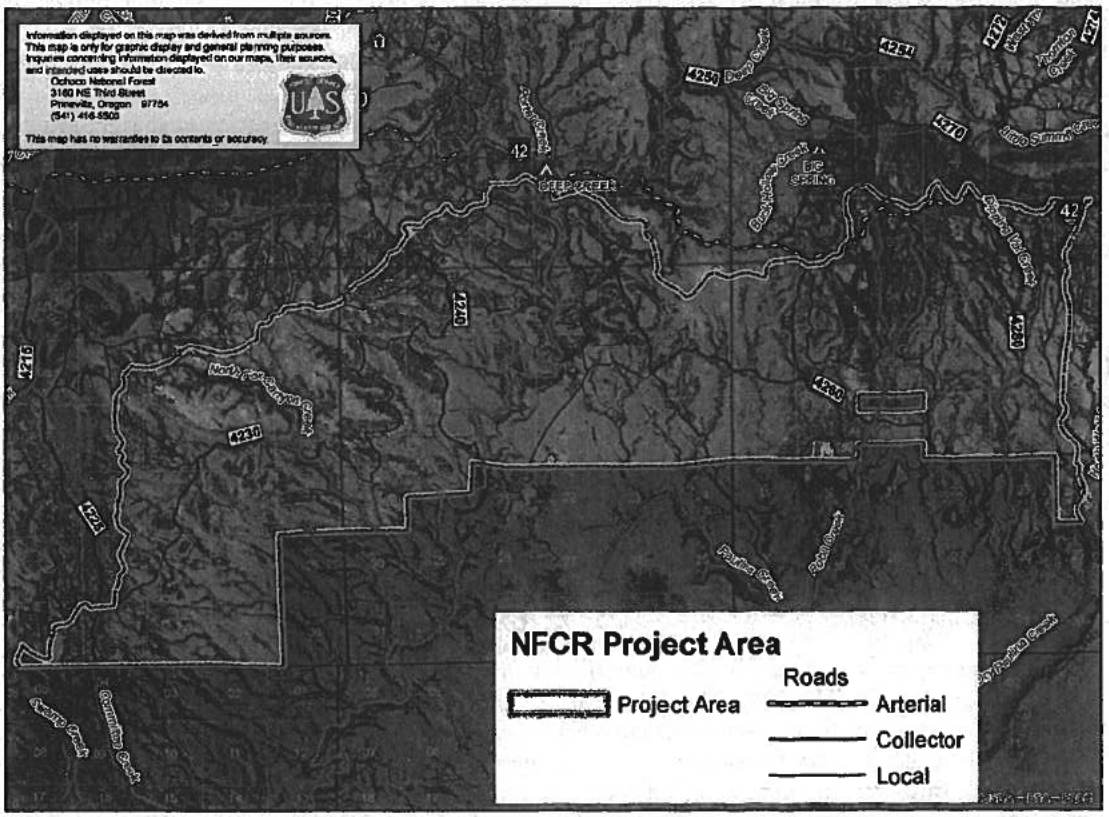


Figure 2: Aerial Photo of NFCR Project Area.

Purpose and Need

This project was developed on management direction in the Ochoco Land and Resource Management Plan as amended (Forest Plan) and best available science. Best available science included the peer-reviewed climate change vulnerability assessment, *Climate Change Vulnerability and Adaptation in South-Central Oregon* (Halofsky et al. 2019), which examined how climate change will impact various resources in the Ochoco National Forest and other areas in South-Central Oregon and identified adaptation actions.

There is a need to improve forest resilience of the planning area to disturbance events such as insect and disease outbreaks, drought and wildfire; to create vegetation conditions needed to attain riparian

* Please send me a hard copy by mail of Halofsky et al. 2019, "Climate Change Vulnerability and Adaptation in South-Central Oregon."

* The "need" identified on pp. 2-3 would be contradicted by the consequent conditions if commercial logging of mature and any large trees are removed by logging. Commercial logging would impair forest resilience, not improve it, by causing more soil impacts, greatly reducing forest wildlife habitat - which is already degraded - decrease resilience to climate change by reducing carbon sequestration & storage →

* and reducing the already scarce moisture retention, as well as reducing habitat security for elk and deer.

1) * The purpose and need statement (pp 2-3) would best be met by non-commercial thinning by hand or by low impact equipment and by prescribed burning, not by commercial logging with heavy equipment

of mature and large trees in this already extensively over-logged and

management objectives; to promote adaptation to climate change; and a need to improve habitat security for big game.

cattle-damaged area, which already has very few mature forest stands and hardly any old growth habitat left due to past logging and likely wildfire suppression.

Cascading Impacts from High Tree Density

While landscapes in this planning area evolved with disturbance events, current forest conditions shaped by past land management practices and exacerbated by a warming climate result in increased risk of uncharacteristic disturbance. For example, forested stands in this planning area have increased risk of high or moderate intensity wildfire where they historically would have experienced mainly low intensity wildfire because tree density and fuel loading are higher than historical levels. Warmer temperatures resulting from climate change may drive lower fuel moistures which may increase frequency and extent of wildfires (Halofsky et al. 2019). These factors also increase stress and consequently reduce resilience of large and old trees. *2) We agree that "past land management practices" contributed to the existing degraded condition, but planned commercial logging, removal of mature trees, extensive ground disturbance and soil impacts, re-opening of closed roads, and continued livestock over-grazing would repeat the mistakes and results of past management mistakes, increasing stress to the ecosystem and further reducing the resilience of large and old trees, contrary to the stated purpose and need.

"Tree densities exceed historical densities which results in more closed canopy structure with multiple canopy layers leading to increased ladder fuels." Some areas also have juniper encroachment. "These factors increase acres at risk of loss to disturbance by insect, disease, wildfire or drought" resulting in an imbalance of habitat types for different wildlife species. For example, "open, park-like stands of single canopy ponderosa pine that historically existed in the project area are almost completely absent." Wildlife species such as the white-headed woodpecker depend on these open park-like habitats. 6) We agree that "..." due to past logging of mature & large trees & over-grazing.

High stand densities of conifer reduce sunlight and water resources for riparian hardwoods, grasses, sedges, and forbs (including Peck's mariposa lily) contributing to poor or functioning at-risk riparian conditions. Riparian areas associated with perennial streams lack large wood, deep-rooted riparian shrubs, and hardwoods, failing to provide quality habitat for aquatic species such as inland Columbia Basin Redband Trout and calving/fawning habitat for ungulates. In comparison, riparian areas of intermittent streams inherently already have a reduced density of wetland obligate vegetation due to larger degrees in fluctuation of water availability throughout the seasons. Therefore, they tend to be more vulnerable to upland and conifer vegetation encroachment. 5) Large and old trees have already been removed or stressed by past (*7) most logging and increased stress from small trees
Losing large and old conifers to insect and disease or wildfire would negatively impact wildlife species that depend on such trees and impact the scenic quality of the Wild and Scenic River Corridor. Juniper encroachment on scablands has reduced water and sunlight, impacting availability of browse and forage for wildlife and livestock. Increased levels of invasive grasses on scablands also increases fire's ability to spread between the stringer habitats. 4) Logging mature and large trees would increase drying out of the forest in addition to warmer temperatures from climate change due to loss of shading & down wood.

7) * by logging.

Climate Change

Climate change may exacerbate departed conditions in project area. The projected temperature increase for the vicinity is 1.3 to 4.0°C by 2050 (Halofsky et al. 2019). The dry forest types that are common in this project area are less sensitive to warming than other forest types because they may be able to migrate into more suitable habitat over long periods of time (e.g., higher elevation, and at Forest-wide or regional scale vs project scale). However, warming will likely contribute to an increase in frequency and extent of wildfires; dry forests may experience widespread mortality because of compounding stresses (e.g., drought) (Halofsky et al. 2019). Increased biomass buildup from invasive annual grasses like cheatgrass, medusahead, and ventenata could promote spread of wildfire in the future (Halofsky et al. 2019); this could have particular significance in this planning area where such grasses create a continuous fuel bed across scablands which once served as natural fuel break between forested stands. *5 (cont.) from competition for water & nutrients, leaving mostly large & old tree snags & logs, not live trees - see

Climate change may also contribute to declining snowpacks, lower summer stream flows, and warmer water temperatures, reducing quality habitat for Columbia spotted frog, Inland Columbia Basin Redband Trout, and western ridged mussels (Halofsky et al. 2019). Scientists predict climate change may also increase frequency and intensity of flooding because of increases of peak stream discharge and rain-on-snow events (Halofsky et al. 2019). our field survey photos & survey sheets. Large & old trees are at a great deficit.

This project borders vegetation management projects that we either implemented recently or are presently implementing: Black Mountain (signed 2019), Gap (2016), Wolf Creek (2014), and Jackson (2012). This

3) * yes, "forested stands in this planning area have increased risk of high or moderate intensity wildfire" (p. 3), but that is due to the proliferation of dense, small young trees, not the scarce mature forest stands with most mature trees already widely spaced from past logging or from the almost non-existent large/old trees due to intensive past high-grading. It is only small, young tree density that is notable or excessive throughout the sale area - see our many photos showing these conditions and our survey sheet descriptions. "Fuel loading" is higher due to small young tree density (up to 9-10" dbh in most cases), not due to mature or large trees. This is an important distinction that should have been disclosed.

project would create landscape scale continuity of more resilient forests in this part of the Ochoco National Forest.

Specific adaptation actions to climate change recommended in the vulnerability assessment and included in this proposed action are:

- Use commercial and noncommercial thinning to reduce overall stand densities to improve forest health and resilience to disturbance.
- Manage fuels to reduce fire intensity which in turn may reduce erosion that degrades aquatic systems.
  - Improve riparian vegetation by using commercial and non-commercial thinning to release riparian vegetation from competition with conifers. Improving riparian vegetation to increase or maintain streambank stability.
  - While both riparian hardwoods and conifers provide stream shading, many riparian hardwoods resprout after wildfire, providing stream shading again more quickly following a wildfire event.
- Fell trees to create floodplain/stream roughness which will decrease impacts of flooding.
- Protect springs, seeps, and wetlands from negative project impacts with resource protection measures.
- Conserve or enhance key wildlife resources and habitats that are underrepresented in the planning area (i.e., promote open forested stand conditions).
- Use road system changes to decrease wildlife disturbance from human interactions.
- Decommission specific road segments to decrease road impacts to streams and riparian habitat conservation areas.

These activities also align with suggested activities for responding to shifting wildfire regimes and intensifying disturbances identified in the Forest Service's Climate Adaptation Plan, which was released in July 2022 (USFS 2022).

Minimum Road System and Big Game Security

The spatial arrangement of open roads and closed roads that are being driven on, negatively impacts habitat security for big game and decreases habitat connectivity. This contributes to a decrease of use by big game species in the planning area.

Specific objectives of the project are to:

- Decrease tree density, maintain ponderosa pine, and create open stand conditions where lacking;
- Maintain large, old trees and related values connected with wildlife habitat throughout the planning area and scenic values in specific areas of the Wild and Scenic River Corridor.
- Reduce hazardous fuels and the risk of uncharacteristic wildfires.
- Improve or maintain riparian habitat conservation areas.
- Enhance habitat conditions for Peck's mariposa lily (*Calochortus longebarbatus* Var. *peckii*), a rare and endemic plant, and other special plant habitats.
- Reduce risk of wildfire spread from National Forest lands to neighboring private and Bureau of Land Management lands south of the planning area.
- Provide wood products to the public.
- Reduce open road density and improve big game habitat security.

The proximity of four timber sales surrounding the N. Fork Crooked River timber sale area that were either implemented recently or are presently being implemented by the FS substantiate our argument that there is too much commercial logging on a landscape otherwise large tree growth, greatly degrading wildlife habitat & reducing forest moisture retention & tree carbon sequestration & storage over potentially hundreds of years. By comparison, most timber products store carbon for only a decade or less. Likewise, wildfires store more carbon in the ecosystem than logging, with retention of fine trees, snags, logs, and ash returned to soils.

Yet the EA does not disclose the science revealing these outcomes. See our Ph.d. science summaries enclosed with citations & findings not being disclosed or discussed in the EA.

* See p. 3 last par. w/2019, 2016, 2014, & 2012 signed decisions
1) Using commercial-size logging ignores the existing conditions in the sale area.
3) There's hardly any mature trees left in RHCAs.
4) We support riparian hardwood recovery through NCTing, prescribed fire, planting native hardwoods, and excluding cattle from all RHCAs.
5) We support felling trees <15" dbh for floodplain & stream roughness.
6) We support protection of springs, seeps, & wetlands, & NCTing & prescribed burning to open up dense stands - esp. PP dominant stands.
We are opposed to reopening closed roads that are not being maintained for seasonal use & construction of any so-called "temporary" roads. We support road closures & decommissioning to increase wildlife security areas & stop sedimentation of streams.
7) Climate change adaptation measures cited are mostly acceptable to us with the exceptions of commercial-size logging, which is unwarranted in this sale area, and re-opening closed roads or building "temporary" roads, which is unnecessary & harmful to ecological resilience.
8) We agree that: "—"
Wood products such as firewood and posts & poles could be provided to the public but logging mature & large trees would exacerbate forest destruct
9) We support most of the stated specific objectives of the "project" on p. 4, with the following exceptions.
Only small tree density is excessive due to past highgrading and landscape scale reduction of mature forest (e.g. w/significant numbers of trees >15" dbh), so only small tree density (usually only up to 9-10" dbh or 12" dbh at most) should be reduced. We support maintaining and increasing large old trees by not logging any large trees and not logging mature trees ≥15" dbh in order to reduce the great deficit of mature & large trees compared to historic conditions. Don't re-open closed roads, which is contrary to reducing

Management Direction and Guidance

Ochoco Land and Resource Management Plan

The Forest Plan, as amended, provides guidance for management activities on the Ochoco National Forest. It establishes goals, objectives, and desired future conditions, identifies management areas within the Forest, and provides standards and guidelines for each management area as well as standards and guidelines that apply Forest-wide (USDA Forest Service 1989b). See Figure 3 for a map of the management allocations.

Table 1: Emphasis and acres of management areas in the planning area.

Management area	Management Emphasis	Acres	Alt.2 Acres	Alt.3 Acres
General Forest	Produce timber and forage while meeting Forest-wide standards and guidelines for all resources. In ponderosa pine stands, management will emphasize production of high value (quality) timber.	12,271	4,703	4,703
General Forest Winter Range	Manage for timber production with management activities designed and implemented to recognize big game habitat needs.	11,543	3,580	3,580
Winter Range	Manage for big game winter range habitat.	10,323	2,091	2,091
North Fork Crooked Wild and Scenic River Corridor	Maintain and enhance natural appearing landscape and protect the scenic river designation.	1,923	521	521
Old Growth*	Provide habitat for wildlife species dependent on old growth stands.	868	0	0
Visual Management Corridor (Partial Retention)	Maintain natural appearing character of the Forest along major travel routes, where management activities are usually not evident or are visually subordinate to the surrounding landscape.	626	409	409
Riparian Habitat Conservation Areas (RHCA)**	Manage to maintain or restore water quality, stream channel integrity, channel processes, sediment regimes, instream flows, and the diversity and productivity of plant communities in riparian zones, and riparian and aquatic habitats.	2,963	1,104	1,107

*Two of these Old Growth management areas are located within the Wild and Scenic River corridor. Management direction for both Old Growth from the LRMP and the Wild and Scenic River Management Plan apply in these areas.

**RHCA acres overlap with other Forest Plan Management Areas.

Eastside Screens

In 1995 the Regional Forester amended Forest Plans east of the northern spotted owl range. Known as the Eastside Screens, the primary purpose of the amendment was "to conserve those components of the landscape – old forest abundance, wildlife habitat in late and old structural stages – in relation to larger ecosystem management to protect habitat for certain species of wildlife and to promote the vigor and health

1) Winter range should only be non-commercially thinned up to only 9" dbh if needed and/or prescribed burned, as most winter range has little existing thermal cover, which elk and deer will need to survive more severe winter storms re: under extreme climate change. Hiding cover patches of small trees should be retained for protection against predators. This applies to both "Winter Range" and "General Forest Winter Range" in the North Fork Crooked River Wild and Scenic River Corridor should only be non-commercially thinned up to only 9" dbh if needed and/or prescribed burned to maintain and enhance natural appearing landscape and to protect the Wild and Scenic River designation. 3) Old Growth Management Areas should not be commercially logged, as most of the sale area (the vast majority of it) is lacking historic levels of fully mature and old growth forest structure compared to historic conditions. Any management in old growth management areas should be confined to non-commercial thinning by hand up to only 9" dbh and/or prescribed burned, as long as existing old growth structure (live, snags, and logs) is buffered from fire as old growth structure is deficient on a landscape scale. There should be no commercial logging in RHCAs, as commercial logging is contrary to adhering to the RHCA Management Emphasis and to meeting RMOs.

4) (cont) RHCAs should only be managed with NCTing up to only 9" dbh by hand if needed for establishing riparian hardwoods. Fires should not be ignited in RHCAs but cored back into RHCAs.

*Cont. from below: The critical need to preserve and increase large trees & mature forest cover is imperative in the context of the 6th Mass Extinction and the looming loss of viability of the planet. We are actively litigating *

4) Commercial logging in RHCAs poses an existential threat to protecting habitat & populations of resident native fish, the explicit direction of INFISH. / *Sediment

North Fork Crooked River Forest Resilience Project Environmental Assessment, Paulina Ranger District

(Commercial logging removes mature + large structure for pools & shading & increases excessive forest)

of the forests." (USDA Forest Service 1995a). The Eastside Screens contain guidelines for management of timber sales relative to the Historic Range of Variability (HRV), wildlife connectivity corridors, snags, coarse woody debris, and goshawk management. The Eastside Screens were revised in January 2021 replacing a 21-inch tree diameter limit with a guideline for timber sales outside of LOS that emphasizes recruitment of old trees and large trees (USDA Forest Service 2021a).

INFISH 3)* against the 2021 revision of the Eastside Screens, which already portends landscape scale significant

The "Inland Native Fish Strategy Environmental Assessment and Decision Notice," herein referred to as INFISH, amended the Forest Plan by establishing riparian habitat conservation areas (RHCAs), establishing numeric riparian management objectives (RMOs), and establishing standards and guidelines for activities occurring in RHCAs. INFISH direction is intended to protect habitat and populations of resident native fish outside of anadromous fish habitat (USDA Forest Service 1995b). cumulative negative

North Fork Crooked River Wild and Scenic River Plan ecological impacts.

Forest Service and Bureau of Land Management (BLM) jointly prepared a management plan for 34.2 miles of the North Fork Crooked River which was designated by Congress in 1988 as a Wild and Scenic River under the Oregon Omnibus Wild and Scenic Rivers Act. The 1993 management plan is an amendment to the 1989 Forest Plan. The overall goal for the Wild and Scenic River corridor is to protect the free-flowing river with a diverse, dynamic, sustainable ecosystem, ranging from wet prairies to basalt canyons. Management or activities occurring within its boundaries are to maintain and enhance the outstandingly remarkable values (ORVs) for which the river was designated. In Segments 3 and 4 within the project area, the ORVs are scenery and recreation. 5)* Commercial logging is incompatible w/ the wild + scenic river goal & ORVs.

(*) We are strongly opposed to the revision of the Eastside Screens in January 2021 (during the pandemic just before Trump left the Presidency) to replace the legally enforceable 21" dbh limit for logging live large trees with a toothless voluntary guideline that has already stimulated plans to log off large trees under broad comprehensive rationales for multiple tree species with no apparent limit to the numbers of large trees removed - even in multiple landscape scale timber sales on the multiple National Forests in the Blue Mountains - including the Malheur NF, the Umatilla NF, and the Wallowa-Whitman NF. Yet David Milo Rexler's study has shown that only about 3% of these Forests have large trees - a huge deficit compared to historic conditions (re: pre-European colonization baselines that are supposed to be used to determine the Large tree structure is critical to protect from logging removal due to its importance to suitable habitat for many wildlife species, including management Indicator species, including Pileated woodpecker, Northern goshawk, Lewis' woodpecker, Williamson's Sapsucker, Northern Flicker, and White-headed woodpecker and American marten. Of these marten are ranked as "Vulnerable" and declining in Oregon, while sensitive-listed and declining species include Lewis' woodpecker and White-headed woodpecker. Other species of concern and/or declining Sensitive species dependent on large tree structure include Pacific fisher, Great Gray owl (Focal), and MK Sensitive Redband trout. Threatened-(sensitive) ↗ listed fish species that require an ongoing source of large snags and logs (as well as shading large tree canopy include Mid Columbia Steelhead trout, Bull trout for pool formation and Chinook salmon. Further, 6) it is more important than ever to retain and increase large tree structure (by not commercially logging large trees or prem their increase by logging out mature trees) for our long-term carbon sequestration and storage to reduce + slow extreme climate change (c

Large tree logging - and most or all mature tree logging - would not achieve the goal of reducing any excess tree density & improving tree growth, since the density is only small trees, ~~tree~~ enhancing forest health, & improving species composition (very few sale units have tree species diversity - most are Ponderosa pine, and the mixed conifer has evidence of being historic → mixed conifer. "Economic opportunity" has to be shelved as an objective or goal when the forest is already so extremely degraded by past logging of large and mature trees!

Public Involvement and Issues

Public Scoping

The Forest provided a "Pre-scoping" resource summary to the public through our webpage in February 2022. The proposed action was initially published in the Schedule of Projects on April 1, 2022. The scoping period took place between August 15, 2022, through September 18, 2022 – subscribers to our mailing list received a scoping packet and were given the opportunity to provide their feedback. The project also appeared on the project webpage with a story map. 18 responses were received (5 individuals and 13 organizations). The Forest also hosted a field trip for stakeholders and a public meeting in the town of Paulina in June 2022. The interdisciplinary team used the comments and issue statements to develop alternatives and project design features. * The Forest Service needs to go look at all the proposed sale units on the ground. The only significant density is small NCT-size trees, not large trees, not fully mature trees, & not otherwise in RHCAs. This is obvious on the ground.

Planning Issues

The interdisciplinary team (IDT) used the public input to revise the proposed action. In particular, the proposed road closures were modified based on public input. Comments were also used to identify key issues around which an alternative was developed. Key issues analyzed in this EA are thinning in RHCAs and thinning trees larger than 21" DBH.

In addition to the key issues, other environmental components will be considered in the environmental consequences section to compare the alternatives, though they did not result in differing design elements between alternatives. These issues are important for providing the Responsible Official and public with complete information about the effects of the project and how well each alternative meets the purpose and need. Impacts to the following resources are assessed: forested vegetation, fuels, soils, water quality, aquatic species, wildlife (Threatened, Endangered, and Sensitive species), range, botanical resources, invasive plant introduction and spread, transportation, unroaded areas, and cultural resources. *Cont. 4) Most of the old growth in the sale area is already single stratum LOS. ~~Gra~~ Large Grand fir are not dense at all.

Key Issue 1—Thinning any species over 21" DBH

1) Re: Comments received in response to scoping focused on concerns about thinning of any species over 21" DBH. There's hardly any Grand fir in the 21-30" dbh range. Logs.

The proposed action that was scoped with the public called for commercial thinning on 9,766 acres. Some commenters are concerned about the removal of large trees and how it might impact the landscape by creating an even-aged stand and not reduce the impacts of wildfire and insect and disease.

2) *There are very few sale units that even have large tree size classes! Our photos on our survey sheets show some of the sale units w/ more old growth structure that need to be dropped from commercial logging.

Discussion: Thinning 2) from below in the NFCR project focuses on removing smaller trees of less desirable species before moving into large size classes. When moving into the larger size class, trees will be selected based on species and tree health. The goal is to reduce tree density to improve tree growth, enhance forest health, influence species composition and provide economic opportunity. Re: 3) 5) 4) * Go see for yourself how few large Grand firs are left throughout the sale units! (* Cont above)

In Alternative 2 where thinning activities are planned within late old structure (LOS) multi-strata stands, ponderosa pine, Douglas-fir and western larch larger than 21" DBH will not be cut. Grand fir 21"-30" DBH may be removed when necessary to reach desired density described in Powell 1999 and only where the removal of grand fir 21"-30" DBH will not reduce abundance of single strata LOS. The only stands proposed for removing grand fir 21"-30" DBH are within the dry grand fir plant association group multi stratum LOS. This issue is addressed with the design of Alternative 3. In Alternative 3, commercial thinning would be thinning from below and would not include the removal of any conifer trees > 21" DBH.

Further details are described in Description of Activities in Chapter 2.

Most of the other sale units have hardly any large trees. Conditions are dismal, so we didn't send you all the photos of the most degraded sale units from past logging. See our survey sheets. Large trees across species are more resistant to fire, and should be fully protected from logging - also due to multiple wildlife species depending on large tree structure and the critical need to maximize long term tree carbon sequestration and storage to reduce extreme climate change. Large trees which also store carbon as snags and logs are the biggest source of carbon sequestration and storage in the forest. The viability of this planet is at stake requiring extensive forest protection. The Forest Service needs to stop its mission of logging to the point of no return

Key Issue 2—Vegetation Management in Riparian Habitat Conservation Areas and Potential Impacts to Streams

Under Alternative 2, there are 1,104 acres of vegetation treatment within RHCAs. Of the 1,104 acres, 259 acres are commercial thinning. Commenters question the need for these activities and expressed concern about potential impacts and necessity of thinning in riparian areas.

Discussion: The purpose of treatment is to contribute to attainment of RMOs either directly or indirectly by achieving desired vegetation characteristics. In particular, the removal of conifers allows for the release of hardwood vegetation which is important for shade and bank stability. Riparian hardwoods are less susceptible to fire and respond positively to fire and other disturbance events in a relatively short time frame. Riparian shrubs also provide forage for songbirds and other wildlife. Additionally, treatment of hazardous fuels and other management actions to move vegetative conditions back within the historic range of variability for the project area's dry forest type will reduce the risk of catastrophic wildfire within RHCAs and along stream-riparian corridors.

This issue is addressed in Alternative 3 by only having non-commercial thinning in RHCAs. Fuels within RHCAs are proposed to be grapple piled unless there are site specific restrictions, such as slope >20%.

*Maps of RHCAs in commercial and non-commercial thinning units can be found in Appendix A.

Key Issue 3—Wild and Scenic Treatments

Comments received during the scoping process included concerns about what are considered hazardous fuels and how does this impact the natural and scenic values of the Wild and Scenic River Corridor.

Discussion: The North Fork Crooked River resource management plan "desired conditions" are separated and described by segments. Each segment shares the same desired conditions of "Protection and enhancement of riparian areas and water quality is emphasized," and "timber harvest such as thinning, deemed necessary to implement the vegetation management plan may occur if the objective is to maintain or enhance scenic, recreation or water quality values over the long term"

This issue is addressed in Alternative 3 by eliminating commercial thinning within the Wild and Scenic management corridor. Only non-commercial thinning would occur. Fuels within the Wild and Scenic management corridor are proposed to be grapple piled unless there are site-specific restrictions. Resource Protection Measures to maintain scenic integrity are included in Appendix B—Table B1.

Chapter 2- Description of Alternatives

The issues have led to the development of Alternative 3, which will differ in terms of the intensity of the footprint (the level of activity proposed on each acre). This provides an opportunity to compare the trade-offs of different approaches which are all designed to meet the purpose and need for action at some level.

This section provides summaries of the activities to occur under each alternative. Unit-specific actions and description of those actions can be found in Appendix C. Resource protection measures by resource area and objectives that reduce negative impacts and ensure consistency with management direction are found in Appendix B.

Alternatives Analyzed in Detail

No Action – Alternative 1

In this analysis, no action means that none of the proposed vegetation management activities or modifications to the transportation system would take place. The No Action alternative serves as a baseline for comparing effects of other alternatives. Management actions would continue such as wildfire suppression, cattle grazing and permit administration, and invasive plant control. Under the No Action, the thinning, fuels treatments, and road changes would not occur.

Action Alternatives

Both action alternatives include resource protection measures and best management practices that are listed in Appendix B to reduce or eliminate potential negative environmental impacts or promote desired outcomes to various resource areas such as aquatics and hydrology, botany, invasive plants, scenic values, wildlife, and others.

Alternative 2

This is close to what was scoped with the public in August 2022. Some modifications have been made due to refinement of proposed actions and in response to the scoping comments that were received. Maps of the treatment units can be found in Appendix A and a Unit list with proposed treatments is in Appendix C.

This alternative involves silvicultural treatments and fuels reduction across 11,065 acres, and fuel treatments on an additional 242 acres. Commercial thinning will produce approximately 24.5 mmbf.

Table 2. Acres of proposed vegetation management activities.

Activity	
Density Reduction:	
Commercial thinning, ground-based (followed by noncommercial thin and fuels treatment)	5,851
Noncommercial thinning only (followed by fuels treatment)	5,214
Post-Thinning Fuels Treatments:	
Grapple pile and/or hand pile of slash (followed by pile burning and underburning)	8,828
Hand pile of slash (followed by pile burning and underburning)	1,936
Total thinning / fuels reduction footprint	11,065
Fuels Treatment Only:	
Underburning only	242
Total footprint	11,307

Alternative 3

This alternative will involve silvicultural treatments and fuels reduction across 11,073 acres and fuels treatments on an additional 234 acres. Commercial thinning will produce approximately 18.1 mmbf. Maps of the treatment units can be found in Appendix A and a Unit list with proposed treatments is in Appendix C.

Under this alternative, the commercial thinning within RHCAs is changed to non-commercial thinning only and no trees > 21" DBH would be removed.

Table 3. Acres of proposed vegetation management activities.

Activity	
Density Reduction:	
Commercial thinning, ground-based (followed by noncommercial thin and fuels treatment)	4,207
Noncommercial thinning only (followed by fuels treatment)	6,866

1) * Please don't use grapple piling, as there is already widespread evidence of detrimental soil conditions from past logging and livestock grazing including unregenerated skid trails, areas of bare ground, and simplified plant communities. Ground disturbance and severe soil burning would * greatly increase the introduction and dispersal of invasive plants, which would increase fire risk and reduce plant biodiversity.

4) (cont.) to reduce the spread of insect epidemics. Tree species diversity is also important for maintaining native plant diversity and more moisture retention from shading in natural mixed conifer. Many wildlife species need higher canopy closure or density.

Post-Thinning Fuels Treatments:	
Grapple pile and/or hand pile of slash (followed by pile burning and underburning)	8,768
Hand pile of slash (followed by pile burning and underburning)	2,004
Total thinning / fuels reduction footprint	11,073
Fuels Treatment Only:	
Underburning only	234
Total footprint	11,307

8) It's disgusting to read the rationalization to justify eliminating last old growth / large trees & tree species diversity.

7) It is very cynical & disingenuous to give precedence to achieving artificial fairly arbitrary density ranges by removing the few large trees.

Description of Activities

2) * The intent of thinning is stated to be "to improve stand resilience and maintain and/or enhance late and old structure (LOS) components in ... stands" (EA p. 11) yet this intent cannot be met if large trees are logged as under alt. 2. It is completely contradictory to have an intent to maintain and/or enhance late and old structure in stands. This is quite obvious on the ground where there is a great deficit in large and old structure across the entire scale area on a landscape scale due to past heavy logging removal of large and old trees.

Silvicultural Treatments

The intent of vegetation treatments is to improve stand resilience and maintain and/or enhance late and old structure (LOS) components in treatment stands. Therefore, retention of old and large trees is emphasized in all treatments. Trees that exhibit external morphological characteristics that suggest an age ≥150 years old would be retained (except where they present a safety risk to operations). Identification of old trees is based on tree characteristics discussed in guides such as Identifying Old Trees and Forests in Eastern Washington (Van Pelt 2008) or best available science. These include bark characteristics, branching structure, and crown form.

3) The authors of Van Pelt 2008 clarify that the visual characteristics discussed for determining old growth status is not as likely to be accurate for firs. So inevitably old growth firs would probably be logged though they are very few overall.

Vegetation Management common to all action alternatives

5) * We oppose management for conversion to & maintenance of sterile pine plantations.

Commercial Thinning (HTH) and Non-Commercial Thinning (NCT)

This treatment would occur across multiple stand types at risk of uncharacteristic wildfire and/or mortality from insect and disease. Thinning increases individual tree growth and reduces crown fire potential and insect risk by reducing fuel connectivity and overall stand density. Reduced stand density would protect and enhance wildlife habitat and make stands more resilient, bringing the landscape closer to the historic range of variation. Implementation would primarily include thinning from below, which removes the smallest trees first until the desired density is achieved. Various techniques such as marking or designation by prescription would be used to maintain or increase variability in tree spacing. Less fire-resistant tree species, such as thin-barked lodgepole pine and white fir, would be preferentially removed, while more fire-resistant ponderosa pine would be preferentially retained. Additional silvicultural activities that may be utilized within thinning units include reduction of ladder fuels that allow fires to move from the forest floor to the canopy; brush cutting and pruning mechanically or by hand of any species can help reduce ladder fuels.

4) * The FS use of HRV to justify heavy logging near clearcutting is very questionable. Tree species diversity retention is important for wildlife & insect

Within the thinning activities, commercial thinning units are expected to produce merchantable timber. Commercial thinning treatments are designed to keep tree densities at desired levels for 20 to 30 years (Cochran 1994). This treatment would generally thin trees from below, removing the smallest and least fire resilient trees first until the desired density is achieved; generally removing grand fir and lodgepole pine before ponderosa pine. The desired densities are generally 50 to 70 square feet basal area per acre for ponderosa pine dry; for mixed conifer dry 60 to 90 square feet basal area per acre (Powell 1999). Where large trees occur in clumps the site-specific desired density is generally at the higher end of the above ranges. There are site specific locations where the desired density range is unachievable without removing trees over 21 inches DBH. These site-specific locations tend to be within late old structure stands that are at a density greater than the upper management zone described in Powell 1999.

8) * Most tree species naturally grow in groups, including p. pine.

Non-Commercial Thinning (NCT)

Further the EA is claiming to intend to retain large trees while planning to remove large Grand fir under alt. 2. Thus under alt 2, it would not be true that "retention of old and large trees is emphasized in all treatments." (EA p. 11, 1st par.) This is glaring hypocrisy. Also, statistically Grand fir were found to be at least 150 years (old growth) at 22" dbh based on FS coring in the ... sale ...

1) The FS is failing to disclose, consider, & use all the more recent science studies showing that there is still a huge deficit in large and old tree structure compared to historic conditions (HRV would require not logging large or old trees at all) and the critical imperative to protect all large trees from logging (since they sequester and store carbon for up to centuries) to in order to reduce and slow extreme global warming that threatens to end the viability of the planet for humans and increasing the risk of losing 10-50% of all species by the end of the century; wildfires, insect outbreaks, and droughts under extreme climate change will inevitably thin the forests (* for wildlife habitat & carbon storage) regardless of any fuel reduction & creating more homogenous plantations under the guise of fire risk reduction. The viability of the planet should take precedence instead of Powell 1999. Quit de incrementally destroying the forest by over-logging it.

All treatment units with commercial thinning will also include non-commercial thinning, in addition there are stand-alone non-commercial thinning units. Proposed non-commercial thinning units would remove trees that are smaller or fewer than the economically viable commercial thinning units but cut material may be sold as chip wood, post and pole, or biomass if market conditions are favorable. Non-commercial thinning primarily removes trees less than 9 inches DBH. Non-commercial thinning would be accomplished by hand or ground based equipment, including mastication and mechanized cutting. Desired stand densities in non-commercial thinning units are generally: 89 to 129 trees per acre in ponderosa pine plant associations; for mixed conifer and Douglas-fir plant associations 114 to 154 trees per acre. The exception to these densities is where clumps of trees ≥ 21-inches DBH are present where residual trees per acre will be less, to improve conditions for large trees and reduce fuel buildup.

2) * Believe us, since we actually surveyed most of the sale units on the ground; there are hardly any large or mature trees in most (or almost all) of the RHCAs, meadows, & upland stands, etc. It's NOT-size small trees that are relevant to encroachment interfering with riparian hardwood growth—along with overgrazing by livestock, which should be addressed. The FS needs to start using smaller dbh limits than 21" dbh for logging—12-14" dbh at most. In this sale, the vast majority of conifer density is only up to 9" dbh. There's no need for commercial mature tree logging in this sale area.

Hardwood Enhancement

Quaking aspen can be found scattered throughout the NFCR project area along streams, springs, rock outcrops, meadows, and upland forest stands. Black cottonwood, mountain alder, bitter cherry, mountain mahogany, and various species of willow commonly occur in riparian areas and near springs and seeps. These hardwood communities provide important wildlife habitat, unique insect and plant communities, abundant forage, and stream shade and stream bank stability in riparian areas. Hardwood enhancement would occur in commercial thinning units, noncommercial thinning units, and in some units would be the only vegetation management activity (noncommercial hardwood enhancement units). Hardwood enhancement would remove conifers that have encroached into hardwood communities, increasing sunlight, nutrients, and water available to hardwood communities. In commercial thinning units, young conifers up to 20.9 inches DBH encroaching into hardwood communities could be harvested; young conifers greater than 21 inches DBH could be cut down and left on site or used for in-stream large wood. In noncommercial thinning units and noncommercial hardwood enhancement units, young conifers could be cut down or girdled and left on site or used for in-stream large wood regardless of DBH. All tree cutting is subject to the project design in Appendix B. In some cases, the cut trees would be felled to create a barrier to livestock or other ungulates. Trees may also be left intact where they have been felled onto closed or decommissioned roads or user-created trails to discourage unwanted vehicle access.

* All existing large trees need to be retained, not just old trees.

All existing old trees would be retained as well as enough young trees to mimic the amounts of conifers that occurred on the site historically. This would be based on evidence present at each site such as stumps or existing snags. Removal of conifers encroaching into aspen sites would follow the recommendations contained within the Aspen Restoration Zones of Agreement (2015) developed by the Ochoco Forest Restoration Collaborative where feasible. Hardwood enhancement may also include planting of hardwoods where they are absent or sparse and installing fencing and/or individual cages around hardwoods where needed to prevent browsing by ungulates. Slash generated from this activity would be left intact to provide protection to the hardwoods, lopped and scattered, underburned, or handpiled.

5) * The FS needs to keep in mind that there were more trees per acre historically in young stands & less trees in old stands.

Ongoing tree mortality

As the Forest has moved through the environmental analysis of this project, there has been a noted increase in tree mortality across the Forest. The Forest has experienced multiple consecutive years of extreme drought, extreme temperature events (also called a hot drought) and increasing levels of bark beetles resulting in widespread tree mortality at varying levels across the Forest and in this project area. In 2022, mortality was primarily in grand fir trees. In 2023 widespread grand fir mortality continues, additional top kill, and increasing ponderosa pine mortality has been noted.

* Grand fir in marginal conditions will be thinned out by climate change droughts. Snags & logs need to be retained *2

The Forest anticipates drought impacts and insect activity will continue and is highly dependent on may factors but will likely impact future implementation of the project. Trees proposed to be removed through a commercial or noncommercial thinning operation may begin to show signs of damage, decline or mortality between NEPA and implementation or between phases of implementation. For example, between preparing and selling a timber sale, between thinning operations and prescribed fire. Dead trees can quickly lose value, and/or become a hazard to operations and humans; and alter prescribed and wildfire activity and risk. The

* There are small streams w/ hardly any large trees

3) * Conifers greater than 21" dbh are not usually "young" but old growth. What happened to recognition of the next size class of 15-21" dbh as that which would restore missing large trees if allowed to grow? They are mature, not "young." There is no reasonable need to cut down conifers >21" for in-stream wood.

amount of snags has changed since the initial snag analysis in NFCR, with an increased number of snags across all size classes.

To alleviate any hazards, trees along roads used for operations within the project area and haul routes within and outside of the project area may be felled when identified using the R6 hazard tree protocol. Hazard trees outside of riparian areas and less than 20-inches DBH may be removed as part of the implementation. Because of ongoing drought, there may be an increase in mortality along roads up until the time of implementation. Therefore, trees within the potential failure zone defined as 150 feet or one and a half tree lengths will be considered for falling and potential removal.

Vegetation Management Specific to Alternative 2

Alternative 2 responds to the purpose and need for action as a modified proposed action that was scoped with the public. Alternative 2 plans a suite of silvicultural activities across the project area that are designed to improve forest resilience. A network of treatment units are proposed as a method of shifting the landscape closer to the historic range in variation while maintaining a diverse range of forested conditions. Alternative 2 does not include removal of large down wood or snags unless they pose a threat to safety. When hazard trees need to be felled (away from roads), they would be left in place and intact as much as possible to enhance wildlife habitat. Commercial thinning followed by noncommercial thinning and prescribed fire is proposed across a wide range of forest types within the project area. As described above commercial thinning would generally be thinning from below. Where commercial thinning activities are planned within LOS multi-strata stands, it will be in a method to enhance the underrepresented late old structure single-strata stands while improving stand resilience to disturbance events. Alternative 2 will not cut Ponderosa Pine, Douglas-fir, and western larch larger than 21-inch DBH and usually not cut grand fir larger than 30-inch DBH but there may be site specific locations where removing young grand fir larger than 30-inch DBH is necessary to achieve the desired stand resilience. There is a proportion of the late and old structure multi-strata stands that are above historic range in variation that will not be able to move into historic range in variation without removing trees over the above diameter ranges. Where commercial thinning activities are planned outside of late old structure stands the prescription common to all alternatives will emphasize recruitment of large trees. Trees of any species greater or equal 21 inches DBH will not be removed. Thinning in riparian habitat conservation areas will include site-specific prescriptions where commercial thinning is proposed in Category 1 and 2 RHCAs (i.e., fish-bearing streams and perennial non-fish bearing streams). Prescriptions will be developed based on slope, aspect, stream condition, soil condition, existing vegetation, large woody material, and other factors at each Category 1 or 2 site. Category 3 (ponds, lakes, wetlands, reservoirs) and Category 4 (intermittent streams or wetlands) sites may have unique prescriptions if needed, but in most cases, "standard" prescription will be applied because conditions in these Category 3 and 4 RHCAs are expected to be similar and consistent across the planning area. Standard prescriptions will be applied for all RHCAs (Categories 1, 2, 3 and 4) where only commercial thinning is proposed. Prescriptions will include sideboards such as, but not limited to, slope and distance from wetted edge where cutting, slash piling, or ground disturbance may occur and which trees (what size and how many) to cut.

Vegetation Management Specific to Alternative 3

Alternative 3 responds to the purpose and need for action as a modified action including comments from scoping. Alternative 3 plans a suite of silvicultural activities across the project area that are designed to improve forest resilience. A network of treatment units are proposed as a method of shifting the landscape closer to the historic range in variation while maintaining a diverse range of forested conditions. Alternative 3 does not include removal of large down wood, or snags unless they pose a threat to safety. When hazard trees need to be felled, they would be left in place and intact as possible to enhance wildlife habitat.

Commercial thinning followed by noncommercial thinning and prescribed fire is proposed across a wide range of forest types within the project area. Commercial thinning will be used as described above in description activities. Alternative 3 does not include the removal of any trees 21 inches DBH and larger. It also does not include removal of large down wood, or snags unless they pose a threat to safety.

Within RHCAs non-commercial thinning is proposed in Alternative 3. Existing and activity created fuels within RHCAs are proposed to be grapple piled unless there are site specific restrictions, such as slope >20%.

Within the Wild and Scenic River management corridor non-commercial thinning is proposed. Fuels would be grapple piled, and piles burned, unless there are site-specific restrictions.

Within Northern Goshawk Post Fledgling Areas (PFAs) non-commercial thinning is proposed. Fuels within the PFAs are proposed to be grapple piled unless there are site-specific restrictions.

Fuel Treatments

Fuels generated in commercial thinning units, non-commercial thinning units and natural fuels accumulations would be treated with underburning and/or burning of grapple piles or hand piles. Fuels treatments are displayed in Appendix A (Maps 9, 10, 11, and 12).

Grapple Piling and Burning - Grapple piling could occur in commercial or noncommercial thinning units. Grapple piling would generally occur where fuel loading is above the desired residue target identified in the Forest Plan Implementation Guide and where slash is too heavy to burn without damaging the residual stand and causing undesirable effects. Slash is piled by equipment such as an excavator with an articulating boom and grapple attachment using existing skid trails on slopes less than 35%. Piles built within stands would be approximately 6-10 feet high and 10-15 feet in diameter. Piles built on timber sale landing sites adjacent to stands would be approximately 20 feet high and 50 feet in diameter. The piles would be allowed to cure and be ignited by hand within 1 season, if possible, to comply with Management Area Standards and Guidelines for the Wild and Scenic River Corridor and Visual Corridor Allocations. Ignitions would take place under favorable conditions. All units planned for grapple piling would also have hand piling identified to account for areas that need protection from machinery such as seeps and springs, or other sensitive areas within a unit.

Hand Piling and Burning – Hand piling would occur in areas where heavy equipment was not utilized in thinning units. Hand piling would generally occur where fuel loading is above the desired residue target identified in the Forest Plan Implementation Guide and where slash is too heavy to burn without damaging the residual trees or in other sensitive areas where underburning alone may result in undesirable effects. Slash is piled by hand into piles approximately 6-8 feet high and 6 feet across. The piles would be allowed to cure and ignited by hand within 1 season, if possible, when conditions are not conducive to unwanted fire spread. Hand piling could occur in commercial thinning units, noncommercial thinning units, or where existing slash is too heavy for underburning, and is identified in combination with grapple piling units to account for protection of sensitive areas. Hand piling is also used in units with slope over 35%.

Underburning - Underburning is proposed to reduce the surface fuels either remaining after previous vegetation treatments or naturally occurring where vegetation treatments have not occurred. Underburning would occur where fuel loading is above the desired residue target identified in the Forest Plan Implementation Guide and where the surrounding trees are expected to withstand low intensity fire. Ignition would take place in pre-determined patterns and under prescribed fuel and weather conditions to avoid undesired fire effects.

To implement underburning treatments, burn blocks will be created utilizing existing roads, natural features, and limited new control lines where the previous options are not available or viable. All control features will be improved up to 150 feet from feature with removal of ladder fuels like brush and small trees as well as snags, or dead trees, that pose a threat to fire personnel safety and to fire containment. Burn blocks will incorporate multiple treatment units to total 500-5,000 acres allowing fire personnel to

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"Only Alt. 3 could be the starting point of any of our negotiations on this sale, as we are strongly opposed to commercial logging of large trees, RHCAs, Wild and Scenic River Corridors, Northern Goshawk PFAs, and large snags unless they are legitimate hazard trees, & removal of large wood. If Forest Service staff compare our survey sheet information & photos indicate the sale units that only need NCT'ing and/or prescribed burning (almost all of them) and which sale units make no sense to commercially log as average tree size and most or all excessive tree density is NOT size or only up to about 12" dbh, with most mature trees already widely spaced & w/ variable density from past commercial thinning.

* Please avoid grapple piling as much as possible since ground machinery & burning of larger piles cause more detrimental soil impacts, on top of already damaged soils across the sale area.

3) It's very rare to see big slash piles burned within the next season. They pose more of a fire risk than live trees. The same concerns apply to hand piles.

* here management impacts from past misguided management forming the existing degraded conditions the EA fails to disclose & analyze. these cumulative effects:

2) cont: loss of productivity and loss of moisture retention from both logging and over-grazing by livestock.

2) What is the past history of logging in the N Fork Crooked River sale area? Why is this not disclosed in the EA? There are obvious cumulative negative impacts from prior logging - high grading removal of most large and old tree structure, loss of most mature forest cover - apparently due to clearcutting and planting of even aged ponderosa pine seedlings, past commercial thinning leaving mature trees so widely spaced as to be virtually sterile, & loss of plant diversity and soil *5

1) ✱ Avoid aerial ignitions, as these are more likely (potentially) to ignite crown fires and be more indiscriminate than burning on the ground where staff can see what should be avoided.

2) ✱ Have the Ochoco staff ever consulted with indigenous people native to the Ochoco NFa regardi indigenous fire methods an timing? If not, why not? The Forest Service could lear

maximize the small seasonal windows of desired weather and fuel conditions that reduce likelihood of undesirable fire effects, also known as burn days. Aerial ignitions, or firing from a helicopter or unmanned aerial system, may also be utilized to reduce risk and exposure to fire personnel. This method also achieves desirable effects in less time than ground ignitions, allowing for higher burn day efficiency.

Burning of heavy fuel accumulations may take place prior to underburning of whole burn blocks to mitigate undesired fire behavior in potentially sensitive areas. This strategy is typically called "jackpot burning". Similarly, "blacklining" is an underburn preparation strategy to mitigate heavy fuel loads adjacent to control lines or critical holding points to reduce the likelihood of fire spread across control lines. Both jackpot burning and blacklining would take place under milder fuels and weather conditions than the subsequent underburn to ensure containment within the desired focus areas.

It may take more than one entry with prescribed fire to meet objectives. alot about where indigenous burning took place when, with what method and for what goals. The lands in Eastern and centr Oregon we subject. indigenous people's burning practices, so the land was shape by this burning for a long t The FS h a lot to lea from indigenous Native people's k better manag next ag forest & other

Potential (wildland fire) Operations Delineations (PODs) – PODs are polygons whose boundary features are relevant to fire control operations. PODs characterize wildfire risk on a landscape, anticipate suppression difficulty and identify potential control locations desirable for meeting objectives and protecting values at risk. PODs are created by local fire experts with the help of analytical tools that highlights landscape features (e.g. roads, ridgetops, water bodies) with control potential and provide information on their likely effectiveness.

The project area includes 17.6 miles of POD boundaries, 10.9 miles of which are forested. Alternative 2 and 3 each plan to treat 5.4 miles of forested POD boundaries that have the higher fuel loads, with denser ladder, canopy and surface fuels. Treatment along POD boundaries will treat the entire stand and not just a buffer around the boundary.

Incidental Burning of Scablands: Unforested scablands dissect forested stands throughout the planning area and potentially create a challenge to efficiently burning forested stands after thinning. It is not intended to use prescribed fire in scablands in between thinned stringers; however, digging fire line around every scabland to exclude any possibility of prescribed fire from creeping from thinned forested stands into scablands would cause an unnecessary amount of ground disturbance and would not be feasible. Scablands were historically fire-evolved and fire-resilient: The sparse vegetation of scablands mainly consists of several small-statured sagebrush species and widely spaced bunchgrasses and wildflowers that historically served to break up fuel continuity and caused wildfires to "skip around" scablands in all but the most extreme fire conditions. With attention to both timing of prescribed fire to forested stands (typically in the spring or fall, with mild conditions, i.e., not hot or windy) and vegetation present in the adjacent scablands (i.e., consider presence of invasive annual grasses), scablands can be allowed to serve as "natural fuel breaks" when underburning is used to manage fuels of thinned forested stands. Subsequently incidental burning to occur in scablands would be allowed. Incidental burning in this instance is defined as prescribed fire that creeps into scablands from underburning of adjacent forested stands (after thinning) or from grapple or hand piles that are burned through active ignition. Incidental burning would not take place within forested stands that are not analyzed for underburying in the action alternatives.* what is "underburying"? Was this meant to be "underburning"? (EA p.15, l par under "PODS")

Travel Management

The goal of Ochoco National Forest is to provide a road system that is safe, affordable, minimizes ecological impacts, and meets immediate and long-term public and resource management needs. Therefore, the Forest includes road and trail system considerations in project-level planning by maintaining, creating, rerouting, closing, decommissioning, or changing assigned maintenance level of roads and trails to meet management and restoration needs, improve forest and stream conditions, increase functional wildlife habitat, eliminate redundant roads, and establish an economically sustainable transportation system.

3) Cont. * Instead, the Forest Service need to fully decommission closed

Road impacts were considered to botany, fisheries, heritage, hydrology, and wildlife as well as access needs for the public, range management, project work, administrative work, and fire suppression, and the proposed road system changes are shown below in Table 4. The Forest would continue to "store" closed roads in our

roads & no keep re-ope them.

5) ✱ The Forest Service should not continue to "store" closed roads for future timber sales (the euphemis used is "projects"), in line with changing course[15] from continuing to log already over-logged forest and never allow it to fully recover and re-wild itself. The current FS logging is completely unsustainable in scale, pace, and intensity. This is not restoration, but liquidation. ✱

roads system database for potential future use, e.g., to use for potential future projects. Access of some of these closed roads will still be authorized for Forest Service administration (e.g., maintenance of range improvements), project-level or on-going work (e.g., invasive plant treatments), and emergency access (e.g., fire suppression). Roads would be closed by various means, including but not limited to gates, rocks, berms, or signs.

"Decommissioning" a road means it would be completely removed from our road system. On the ground, the road prism would be potentially removed from the landscape and/or restore segments of up to about three miles of closed roads specifically where such work (which requires ground disturbance) would accomplish an objective for aquatics and hydrology (e.g., restore hydrologic connection at road crossings). Decommissioning for transportation or botany resource benefit would potentially require ground disturbance only where the entrance to the road needs to be blocked to prevent vehicle use.

No proposal to build any new system roads is included.

Connected actions to this proposed action include:

- Creation and use of temporary roads and maintenance or reconstruction of existing roads to haul cut wood away in commercial units or to provide grapple pile access in noncommercial units. Temporary roads are displayed on the commercial thinning map in Appendix A.
- Road maintenance and reconstruction, and use of haul routes outside of the planning area.

Table 4. Approximate miles of proposed road changes. Specific road segment changes are listed in Table C-3, Appendix C.

Resource Indicator	Measure	Alternative 2	Alternative 3
Maintenance Level	Miles of Maintenance Level 1 to Decommission	9.39	9.39
	Miles of Maintenance Level 1 to Administrative Maintenance Level 2	34.49	34.49
	Miles of Maintenance Level 1 to Maintenance Level 2	0.33	0.33
	Miles of Maintenance Level 2 to Decommission	0.21	0.21
	Miles of Maintenance Level 2 to Maintenance Level 1	6.15	6.15
	Miles of Maintenance Level 2 to Administrative Maintenance Level 2	28.25	28.25
Road Maintenance And Reconstruction	Miles of Road Maintenance*	122.93	109.81
	Miles of Road Reconstruction*	21.69	19.38
Temporary Roads	Miles of Existing Disturbance	19.72	19.34
	Miles of New Disturbance	3.17	4.89

Alternatives and Project Design Not Analyzed in Detail

Do not conduct any vegetation management within Riparian Habitat Conservation Areas or Wild and Scenic River Corridor: Dropping all management within the RHCAs or Wild and Scenic Corridor would not meet the purpose and need for action. Avoiding RHCAs would compromise overall project viability because of the

(*) 1) It is reasonable to have seasonal closures on roads that are still maintained (e.g. for more security habitat during hunting seasons) However, the FS has habitually promised environmental protection groups to close roads and to decommission them, while instead never fully the roads again for the next timber sale, making these defacto system roads.

(*) 3) We are strongly opposed to any construction of "temporary" roads, as they are usually never fully decommissioned and are usually re-used again as defacto open roads and since they: fragment security habitat, encourage ATV access, enable illegal firewood cutting, introduce & disperse exotic invasive plants, and increase access for livestock and fur trapping. We are also opposed to re-opening of closed roads that are not maintained for seasonal use. The FS has built an absurdly extensive road system in National Forests, including the Ochoco, including unnecessary, redundant and ecologically damaging roads.

(*) 2) The Ochoco NF staff have a terrible history of failure to effectively close roads. Rocks, berms, signs, & wooden post & pole gates have generally not worked.

(*) 2) cont.): The road signage and lack of signage has also been massively confusing and counter-intuitive-to us and many other forest visitors. A lot of the theoretically closed roads look open and continually used, while a lot of the open roads are in much worse shape than the "closed" roads, and clearly not maintained. What has the Ochoco staff done to correct this, including for future plans for this sale area? We had to avoid some main areas of open roads while field surveying this sale-at an unmaintained cattle guard and one with a deep hole that could bottom-out my 4 wheel drive truck. We had to figure out alternate routes.

(*) 4) Drop all miles of road reconstruction & opening of closed roads that are not being maintained, and drop all new "temporary" road construction on existing new disturbance wildlife

scab-stringer landscape. Best Management Practices and resource protection measures have been shown to minimize or eliminate unwanted impacts in riparian areas, so an alternative that does no work is not necessary to address the issue.

Chapter 3-Environmental Impacts of the Proposed Action and Alternatives

This section of the EA describes the components of the human environment that may be impacted by project activities described previously. Effects discussions follow CEQ guidance for scope by categorizing the effects as direct, indirect, and cumulative. The focus is on cause and consequences. Measures to mitigate or reduce potential adverse effects caused by the implementation of any of the actions proposed are listed in the section Resource Protection Measures. These measures are an integral component of the action alternatives, and conclusions made about the environmental consequences are made with these measures in mind.

This EA is tiered to the analysis in the Final Environmental Impact Statement for the Ochoco National Forest Land and Resource Management Plan. The FEIS for the Forest Plan disclosed that "active management of forest stands would continue throughout the planning timeframe and would affect environmental components." There will be no impact to Wilderness or Inventoried Roadless Areas because they are not present, and they will not be discussed further:

Project Record

Specialists on the IDT conducted analysis to determine the environmental consequences of the project to their respective resource. Separate specialist reports exist for botany/invasives and wildlife, and in some cases the information in the report is only summarized in this EA. Those reports are incorporated by reference. All other resource areas are addressed directly in this environmental assessment and no separate report exists.

Cumulative Effects Considerations

The following section on environmental consequences includes discussion of cumulative effects. Where there is an overlapping zone of influence, or an additive effect, this information is disclosed. In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects. By looking at current conditions, the Forest is sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects. This approach is consistent with Forest Service NEPA regulations at 36 CFR 220.4(f).

Table 5 lists the actions that are currently ongoing or are reasonably foreseeable. The temporal and spatial scale of analysis is variable depending upon the resource concern being evaluated; therefore, this list is used as a reference. Where the NFCR project would result in an incremental effect when added to any of these projects or activities, it is noted in the cumulative effects analysis for that resource.

Table 5: Ongoing and reasonably foreseeable future activities that may be considered in cumulative effects analysis.

Current / Ongoing Activities	Description
Seasonal livestock grazing and allotment management per annual operating instructions	See AMPs for details on grazing in these five allotments: o Roba (48% of project area) o Fox Canyon (19% of project area) o Big Summit (19% of project area) o North Fork (10% of project area)

It's incredibly disingenuous to not have a table showing past timber sales within the planning area, with the decision dates, types of logging used, & acreages affected. Some of these sales are also still being implemented and should be disclosed in Tables as "ongoing activities" that may be considered in cumulative effects analysis." See Tables on EA pp. 17-18. This is a glaring conspicuous omission demonstrating a heavy bias toward logging to the point of not disclosing specific impacts of past timber sales.

	o Deep Creek, Little Summit, Wolf Creek (~5% of project area)
Invasive Plant Treatments per the 2012 Invasive Plant EIS and Record of Decision	Mechanical and herbicide treatments have been documented annually since 2006 for several invasive species for a total of over 11,000 acres treated (some acres have been retreated multiple times).
Rager and South Boundary Cooperative Access Travel Management Areas	Reduces open road density annually during the period of August 20th to November 20th.
Personal use firewood cutting	The public is allowed to cut and remove firewood within 600 feet of open roads. Affects snag level near roads.
Recreation and recreation special uses	Annual Star Party: Short-term (7 days) increase in public camping on FSR 4230-800 during August Hunting Seasons: turkey in spring, antelope in summer and early fall, mule deer and elk in fall, and antler hunting in late winter and spring. Increase in people and motorized vehicles in area during these times.
Reasonably Foreseeable	
Roadside salvage of hazard trees FSRs 4240 & 800	Felled hazard trees to be removed by moving to a landing with a skidder and log loader.

Forested Vegetation

This report will document analysis of how well each alternative meets the purpose and need, focusing on how well each alternative will improve resilience to insect and disease and move structural stages on the landscape closer to the historic range of variability (HRV). In addition, the following key issues are addressed: Cutting of Trees > 21" DBH; Treatment within Riparian Habitat Conservation Areas (RHCAs); Treatment within Wild and Scenic River Corridor.

Methodology

2) So many models and simulations are used in the methodology, as opposed to comprehensive field surveying, that without knowing the assumptions fed into the models, this process could be a "garbage in, garbage out" scenario. Surely all these models and simulations and assumptions used can not replicate true existing condition on the ground, including variations in tree species composition, the tree sizes causing density, wildlife use of the area, riparian conditions, and existing soil damage extent.

3) We are concerned that the planners of this sale either don't know field surveying evidence such as there being only small tree density & only very few large trees overall – or are biased & misleading the public.

This section includes a description of the methods and data used in this analysis. The existing forest vegetation in the project area was mapped into polygons (stands) of similar characteristics like pattern and texture using eCognition object-based image analysis software. Additional information on this process can be found at: http://www.ecognition.com/sites/default/files/technology.pdf. Individual review of machine mapped polygons occurred at the project level to assure accuracy and stand continuity. Polygons were then overlaid on the Ochoco National Forest Plant Association Group (PAG) GIS layer and assigned a PAG based on which PAG is most abundant in the polygon. These polygons were then populated with tree point information from 2013 LiDAR imagery (Hudak et al. 2009 and Hudak et al. 2008) to define forest structure and density. Species composition was obtained from the Gradient Nearest Neighbor (GNN; Ohmann and Gregory 2002) data set maintained by the Landscape Ecology, Modeling, Mapping, and Analysis team based at the Forestry Sciences Lab on the Oregon State University campus. Final field verification of stands was conducted across the planning area from 2020 through 2022. This total information was used to determine existing vegetative conditions and assign a Viable Ecosystem Management Guide (VEMG) seral/structural class (Simpson et al. 1994) for the determination of calculating the project area's current condition and Historic Range of Variation.

Viable Ecosystem Management Guide was originally developed on the Ochoco National Forest to characterize the potential treatment units and the associated watershed for patterns of stand structure by biophysical environment and compare to the Historic Range of Variation (see Table 6 for definitions of seral

What were the input assumptions used for eCognition software, LIDAR imagery, Gradient Nearest Neighbor, and the Viable Ecosystem Management Guide? We request this information mailed to us. NEPA requires disclosing methodology, which should include assumptions fed into the models or simulations.

stages by structural class). Simpson et al. 1994 provides the historic range of variability for each seral and structural stages across a landscape. The project area is equivalent in size to the associated watersheds. As the majority of the associated watersheds are not contained within the Ochoco National Forest, the project area boundary was used as the equivalent sized landscape. The geographic scope for direct, indirect and cumulative effects is the project area. Common stand exams were conducted on a representative sample of stands to collect data to be used with the Forest Vegetation Simulator (FVS) to characterize stand conditions resulting from each alternative. Protocol from Powell 2013 was used. A range of resource indicators and measures are used to compare alternatives Table 10.

Table 6: Seral/Structural Matrix and Definitions (Seral Structural Stages)

Structure Class	Early Seral Stage with Structural Class	Mid Seral Stage with Structural Class	Late Seral Stage with Structural Class
Grass, forb, shrub (trees may be present but not dominant)	E1		
Seedling, sapling (less than 4.9 inches DBH)	E2	M2	L2
Pole (between 5 and 8.9 inches DBH), high density	E3a	M3	L3
Pole (between 5 and 8.9 inches DBH), low density	E3b	M3	L3
Small (between 9 and 21 inches DBH), high density	E4a	M4a	L4a
Small (between 9 and 21inches DBH), low density	E4b	M4b	L4b
Medium/large (21 inches DBH and larger), high density (LOS)	E5a	M5a	L5a
Medium/large (21 inches DBH and larger), low density (LOS)	E5b	M5b	L5b

Characterization of Late and Old Structure (LOS) is a subset of HRV analysis. According to the 1995 Eastside Screens, LOS refers to structural stages "where large trees are common," i.e. structural classes medium/large high density and medium/large low density.[1] See Table 7 for Ochoco late old structure definitions by PAG with minimum number of trees per acre greater than 21 inches DBH.

Table 7. Ochoco Late and Old Structure (LOS) definitions by PAG.

Potential Vegetation Group (PAG)	Minimum number of Trees per Acre ≥21" DBH
Dry Grand Fir (DGF)	15
Douglas Fir (DF)	12
Mesic Ponderosa Pine (MPP)	12
Dry (Xeric) Ponderosa Pine (DPP)	10

Stands considered to have a high susceptibility to attack by insects and disease are those with high stand densities and/or a large proportion of late seral grand fir and Douglas-fir as shown in Table 8. Stands considered to be dominated by either early seral (i.e. ponderosa pine or western larch) or late seral (i.e. Douglas fir or grand fir) species are shown in Table 9. Stand susceptibility to insect attack is exasperated in drought conditions; stands with high stand densities are under additional stress.

[1] The Eastside Screens were updated in 2021 with a definition of "large tree" being grand fir greater than or equal to 30" DBH and other species greater than or equal to 21" DBH. The LOS mapping completed for this project, however, mapped LOS as where any trees greater than or equal to 21" DBH, at the numbers per acre identified in Table 7. This may result in a slight overestimation of LOS (likely less than 100 acres across the planning area).

*Endemic insects & disease should not be considered a "risk"; but as natural disturbances that thin the forest beneficially and create regenerative new niches for habitat (e.g. after wildfire) that perpetuate biodiversity, as well as variable density and snag and log structure.

Table 8: High Insect and Disease Susceptibility (Risk) Ratings by PAG.

Potential Vegetation Group (PAG)	High Risk Stages
Dry Grand Fir (DGF)	E3a, E4a, E5a, M4a, M5a, L3, L4, L5
Douglas Fir (DF)	E3a, E4a, E5a, M4a, M5a, L3, L4a, L5a
Mesic Ponderosa Pine (MPP)	M4a, M5a, L4a, L5a
Dry (Xeric) Ponderosa Pine (DPP)	M3, M4a, M5a, L4a, L5a
Juniper Woodlands (JW)	NA

2) *Tables 8 & 9 are confusing & opaque in meaning. What is the basis for "high risk stages" in Table 8 for so many "seral" structural stages? Re: Table 9, "seral" stages seem to be conflated with forest successional stages. What is the basis for defining "late seral" versus "early seral"? Are "late seral" stages climax successional stages? Are "early seral" stages early successional stages after (e.g.) wildfire? Why is none of this explained in the text of the EA?

Table 9: Definition of Early and Late Seral species dominated stands by PAG.

PAG	Late Seral (GF/DF)	Early Seral (PP/WL)
Dry Grand Fir (DGF)	L2, L3, L4, L5	E2, E3, E4, E5
Douglas Fir (DF)	L2, L3, L4, L5	E2, E3, E4, E5
Mesic Ponderosa Pine (MPP)	NA	L2, L3, L4, L5
Dry (Xeric) Ponderosa Pine (DPP)	NA	L2, L3, L4, L5
Juniper Woodlands (JW)	NA	NA

Departure from HRV is calculated by totaling deficit acres below min HRV, and the overabundance from max HRV. For example, if a structural stage's HRV is 100-150 acres and there are 75 acres on the landscape there is a deficit of 25 acres. While a different structural stage HRV is 100-150 and there are 200 acres on the landscape there are 50 acres over abundant. The total departure for this example would be 75 acres.

Resource Indicators and Measures

3) *The HRV analysis pretends to be exact and calculable, but it really isn't. Historic range of variability does not boil down to clear deficits or over-abundances, especially as HRV is a broad generalization which may not be useful under extreme climate change (as an article from Pacific Northwest Research Station scientists) asserted. Further, most HRV baselines used are not based on true pre-European colonization survey data, which was very limited and mostly anecdotal and derived from low elevation dry Ponderosa pine forest types.

Table 10: Resource indicators and measures for assessing effects.

Resource Indicator	Measure
Elements of Purpose and Need	
Historic Range of Variability and Late and Old Structure	For all of HRV, acres of structural stages by PAG. Departure from HRV. For HRV of LOS, acres of single strata or multi-strata departure from HRV.
Insect and Disease Risk on the Landscape	Proportion of the landscape in stand conditions at high risk.
Key Issues	
Large Tree Structure	Time to develop large tree structure.
Forest Health Conditions in RHCAs	Proportion and acres of RHCAs highly susceptible to insect and disease
Forest Health Conditions in Wild and Scenic River Corridor	Proportion and acres of Wild and Scenic R Corridor highly susceptible to insect and disease

Affected Environment

Plant Association Groups

4) *This whole "Forest Vegetation" analysis is hopelessly outdated, repeating dogma from 1980's & early 1990's science. This is very old school forestry biases. The goal of this type of analysis has the goal of growing trees to maximize individual tree vigor for plantations and logging, not to restore forest ecological resiliency and ecological processes & functions.

There are four forested plant association groups (PAGs) within the project area. From most abundant to least they are: Xeric Pine 8,804 acres, Mesic Pine 5,600 acres, Douglas-fir 4,137 acres and Dry Grand Fir 1,572 acres. Each of these PAGs are individually compared to HRV.

Non-forested portions of the planning area are not considered in this HRV analysis. They are Juniper Woodland 3,964 acres, and non-forest scab rock 13,476 acres. Any treatments within juniper woodland are expected to move the stands to the grass forb shrub stage which, according to Simpson et al. (1994), was the most abundant historic condition.

Existing Condition Summary

The North Fork Crooked River project area is departed from its vegetative historic range of conditions in multiple aspects. This has resulted in the reduction of resiliency, resistance, and functioning of the forest ecosystem in multiple ways. Shade tolerant understories have developed in the absence of frequent and low to moderate intensity fire. Stands are denser today than historically, with more trees in smaller size classes. The total LOS across the landscape is less than historically expected. There is a deficit of single-strata LOS and an overabundance of multi-strata LOS conditions as compared to historical ranges. Due to the system being so departed from historical conditions multiple treatments may be required in some areas to fully meet desired conditions. Risk to forested stands from insects and disease and other disturbances has increased, is ongoing, and is expected to be further impacted by climate change and recent drought. Density management is one of the few tools land managers can use to reduce, but not eliminate, these risks of large-scale forest loss from drought, climate change or risk of high-severity fires (Cansler et al. 2022, Sankey and Tatum 2022, Halofsky et al. 2019, Sohn et al. 2016).

Existing Condition – Historic Range of Variability and Late and Old Structure

Past timber harvest as well as vegetation management of various forms and fire exclusion have affected forested vegetation in the project area. Meanwhile, tree growth, ecological succession, disturbance, and other processes have continued across this landscape. The total of these effects is reflected in the current condition as displayed in the following charts as Alternative 1.

Environmental Consequences – Historic Range of Variability and Late and Old Structure

Effects Common to All Action Alternatives

The combination of thinning from below and burning activities shifts stands from high density conditions to low density, while removing less fire adapted species shifts stands to earlier seral stages. Within all treatment units thinning from below will retain and emphasize recruitment of large trees. Old trees defined as having external morphological characteristics (Van Pelt 2008) that suggest an age greater than or equal to 150 years will be preferentially retained by the project design criteria in Appendix B. The Forest Service recognizes that there will be some unavoidable errors during implementation in identifying trees ≥150 years old via morphological characteristics; however, these errors are expected to be limited in scope. There is a possibility that trees smaller than the diameter limits and older than 150 years may be removed if they do not display the external morphological characteristics described in Van Pelt 2008. The total effects of the alternatives are aggregated to the landscape changes in condition and are compared by plant association group (see Figure 4 through Figure 7 below). Landscape departure form HRV is considered immediately after treatment, 20 years later (the expected effective time of treatment for a midterm), and 50 years later for a long-term projection (Figure 9)

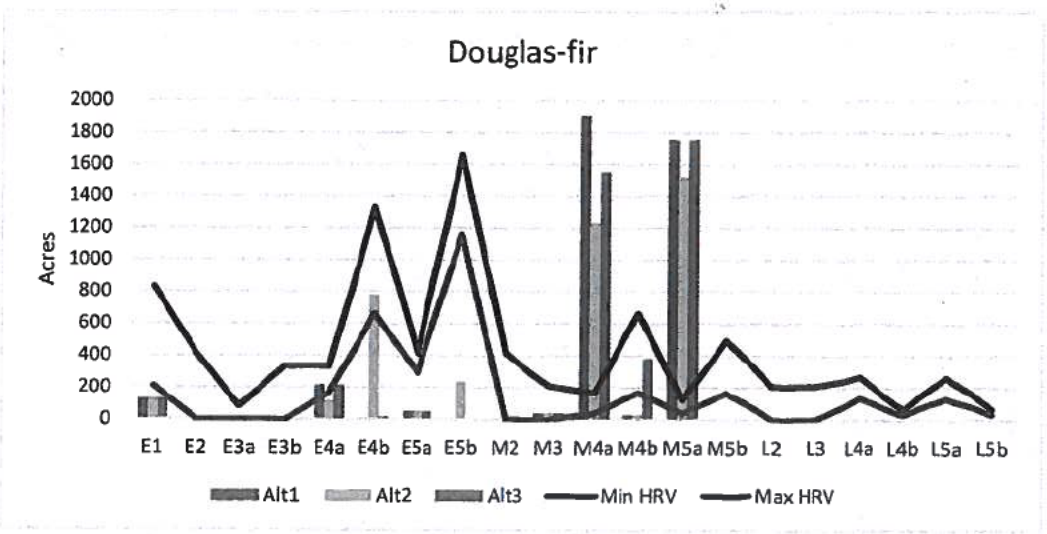


Figure 6. Douglas-fir Seral stage and Structural Class, Alternatives compared to HRV

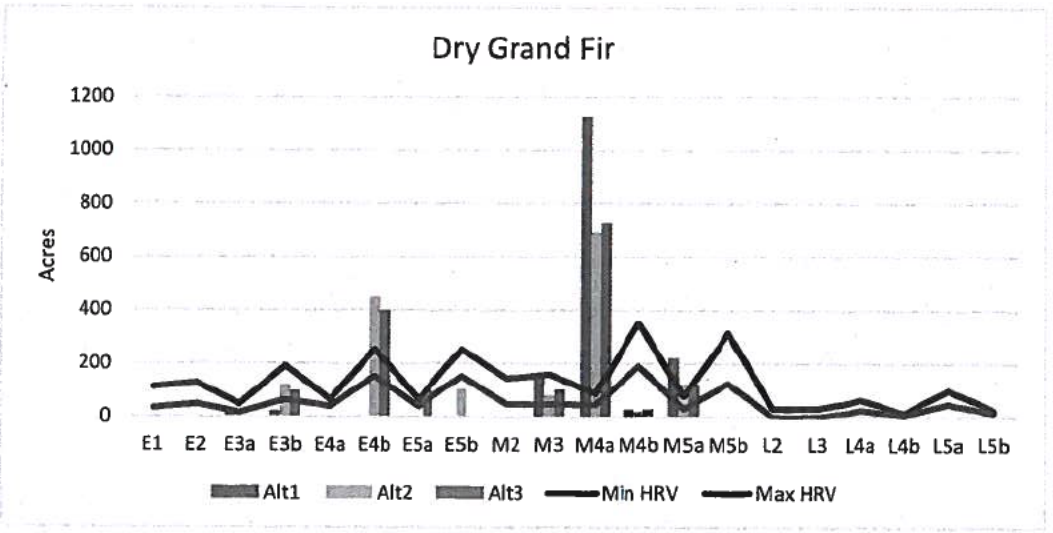


Figure 7. Dry Grand Fir Seral stage and Structural Class, Alternatives compared to HRV

(*) Grand fir is really not going to take over the North Fork Crooked River area, as climate change heat waves, droughts & reduced moisture retention are already thinning out Grand fir in marginal sites - across the Blue Mountains National Forests. Douglas fir in overly dry sites are also thinning out due to climate change. The North Fork Crooked River salvage units are already having climate change-related thinning of Grand fir in particular, with Douglas fir being more adapted to drier conditions. These HRV projections don't seem to be accounting for the effects of natural disturbances and increasing extreme climate change.

(*) So-called "Departure from HRV" can not be realistically be projected out by 20 years or 50 years, given these models don't usually (& can't) build in the effects of future natural disturbances and the escalation of extreme climate changes within 20 to 50 years from now. This is inaccurate use of the science.

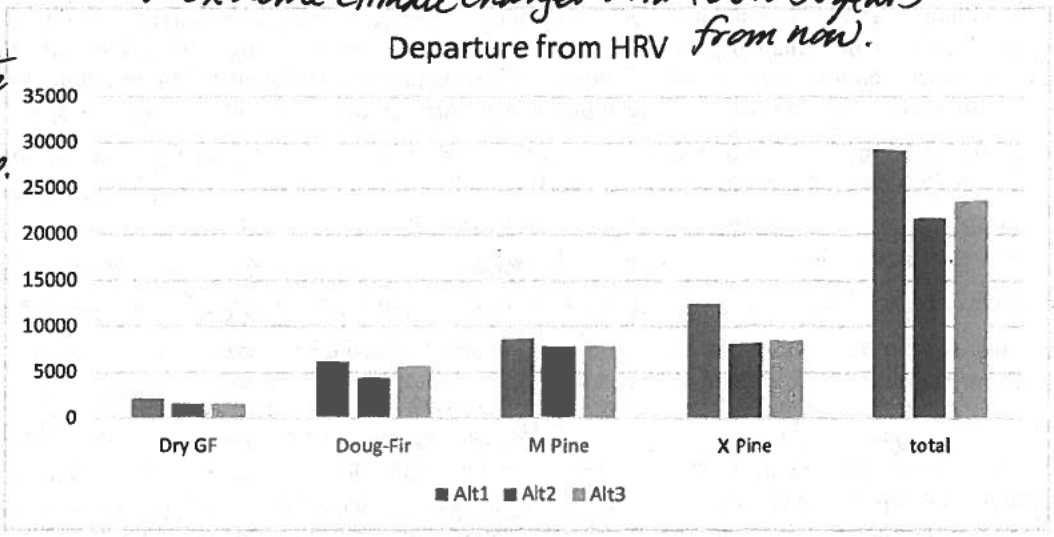


Figure 8. Departure from HRV by PAG and Total Departure

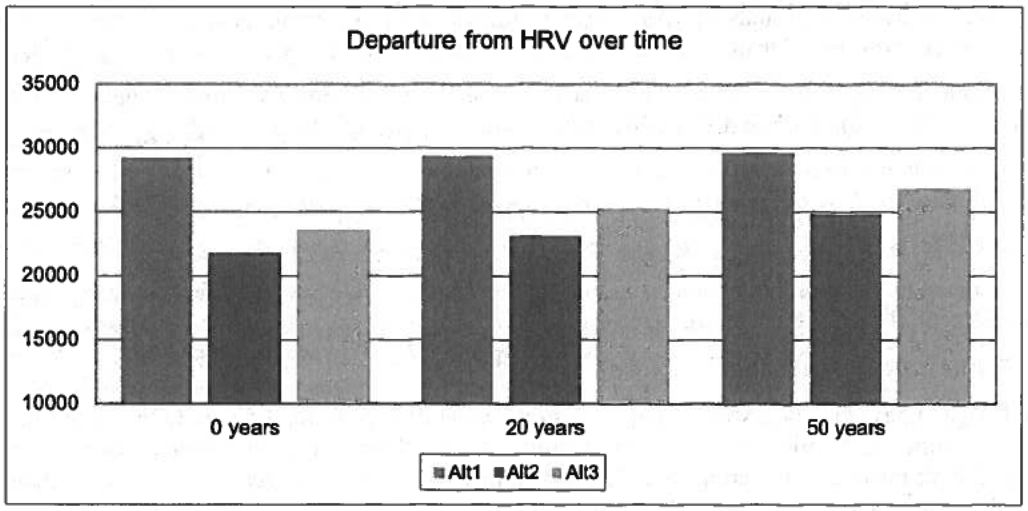


Figure 9. Departure from HRV over time for total landscape.

Effects by Alternative Historic Range in Variation

Alternative 1

Alternative 1 is the no action alternative. There would be no changes to current departure from HRV or any improvement to landscape resilience. Alternative one is used as the baseline to compare action alternatives to. Departure from HRV by PAG: xeric pine 12,410 acres (Figure 4), mesic pine 8,618 acres (Figure 5), Douglas-fir 6,120 acres (Figure 6), dry grand fir 2,108 acres (Figure 7).

Alternative 2

Of the action alternatives alternative 2 reduces departure from HRV the most. There is a 7,440 acre reduction in total departure Figure 8. The reduced departure is a result of shifting the over-represented high density

2) Cumulative effects analysis for forest structure and tree species composition should also consider adjacent and nearby timber sales still being implemented or recently logged all around the North Fork Crooked River sale area. There is a great cumulative loss in all these sales of mature trees, snags, denser forest habitat for dense forest-associated wildlife, and loss of tree species diversity as well as associated plant and wildlife biodiversity. All of these cumulative effects are relevant to this EA section analysis.

stand conditions to the underrepresented low-density conditions, such as the sift form M4a and L4a to M4b and L4b in Figure 4 above. All plant association groups in the project area experience a reduction in departure, while xeric pine and Douglas-fir have the greatest improvement in alternative 2. This reduction in departure represents an improvement in landscape resilience as landscapes that are within or closer to HRV are more resilient to natural disturbance than departed landscapes (Keane et.al.2009).

Departure from HRV by PAG: xeric pine 8,149 acres (Figure 4), mesic pine 7,796 acres (Figure 5), Douglas-fir 4,378 acres (Figure 6), dry grand fir 1,493 acres (Figure 7).

Over time alternative 2 maintains the least departure from HRV (Figure 9). This is because alternative 2 will reduce current departure the most.

Cumulative Effects

Because there are no other proposed actions in the project area that could have an effect on the forested vegetation structural stages, there would be no cumulative effect from this alternative.

Alternative 3

1) ★ This discussion of the difference in assumed "departure from HRV" between alternatives 2 and 3 fails to recognize that most or all excess density is only small NCT-size trees, not mature or large trees. So alt. 3 should be as effective as alt 2 in reducing density. Not mixed conifer stands on historical mixed conifer sites (see our photos & survey sheets) are naturally more productive and a bit denser due to more moisture retention from factors like higher elevation, north aspect slopes, & proximity to water or a higher ground water table. Yet most of the density in the mixed conifer stands is also only small NCT-size trees, due to past overstory logging and likely wildfire suppression.

Of the action alternatives Alternative 3 reduced departure from HRV the least. There is a 5,622-acre reduction in total departure (Figure 8). The reduced departure is a result of shifting the over-represented high density stand conditions to the underrepresented low density, such as the sift form M4a and L4a to M4b and L4b in Figure 4 above. All plant association groups in the project area experience a reduction in departure, while xeric pine and mesic pine have the greatest improvement in Alternative 3. This reduction in departure represents an improvement in landscape resilience as landscapes that are within or closer to HRV are more resilient to natural disturbance than departed landscapes (Keane et.al.2009).

Departure from HRV by PAG: xeric pine 8,531 acres (Figure 4), mesic pine 7,909 acres (Figure 5), Douglas-fir 5,616 acres (Figure 6), dry grand fir 1,578 acres (Figure 7).

Over time alternative 3 does not reduce departure as much as alternative 2 but more than the No Action alternative (Figure 9).

Cumulative Effects

Because there are no other proposed actions in the project area that could have an effect on the forested vegetation structural stages, there would be no cumulative effect from this alternative.

Effects by Alternative: Late Old Structure

Structural stages E5a, M5a and L5a are LOS multi-strata while E5b, M5b and L5b are LOS single strata (Table 6). Thinning and burning activities are proposed in the LOS stands that are within or above HRV. This thinning will have the effects of maintaining the fire and insect disturbance resilience within these stands while manipulating the overabundant LOS multi-strata to the underabundant LOS single strata. Treatment in LOS by plant association group are described below in Table 11. Landscape condition of LOS is considered immediately after treatment, 20 years later (the expected effective time of treatment for a midterm), and 50 years later for a long-term projection (Figure 10, Figure 11, Figure 12).

★ 4) Specifically, Drop all the "HTH" acres of commercial logging within LOS, as shown in Table 11 for alts 2 & 3, on EA p.25

Table 11: Acres of vegetation management within LOS for each alternative by PAG.

		Douglas-fir	Dry Grand Fir	Mesic Pine	Xeric Pine
Alt 2 Primary treatment	HTH	233	101	67	499
	HWD				
	NCT	168	102	28	267
	UB Only	8			13
Alt 3 Primary treatment	HTH	72	99	45	271
	NCT	333	105	50	495

3) ★ Drop all commercial logging in LOS! Noncommercial thinning up to 9-10" dbh is fine, along with prescribed burning, as almost all tree density (if not all) is only NCT-size trees up to 9" dbh. See our survey sheets & photos for LOS sale units. There is no significant excess density in mature and large trees in LOS stands. There's lots of mature & old growth stumps

UB Only	5			13

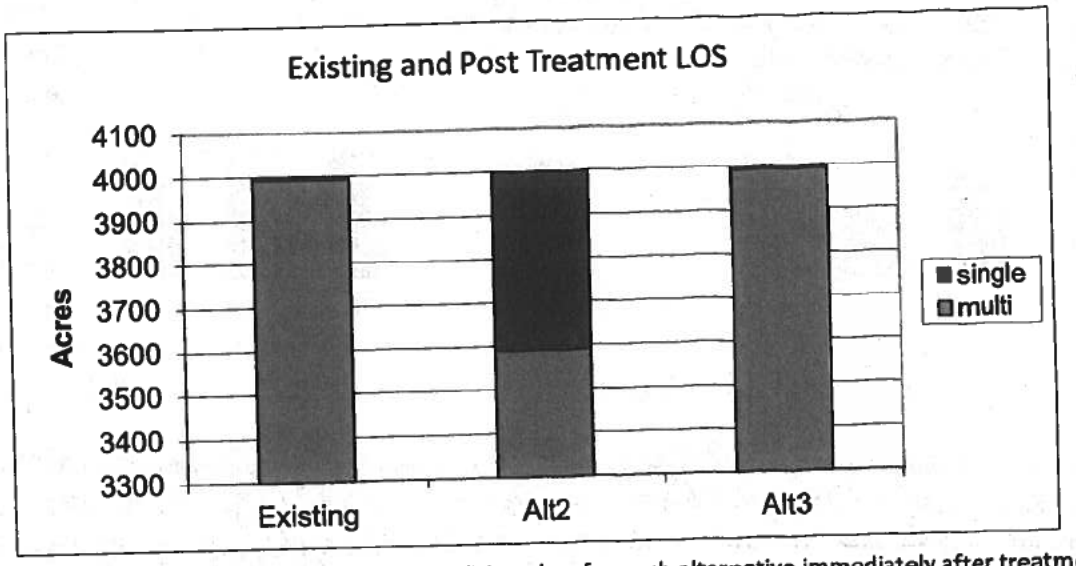


Figure 10. Total LOS on landscape by condition class for each alternative immediately after treatment.

※ Most LOS in the sale units have already been highgraded and commercially thinned, and are still widely spaced.

※ Figure 10 needs clarification. Which are existing versus post-logging acres re: "low acres" & "high acres? To what do the numbers at the left of the graph refer? The LOS is very low in numbers of LOS stands and trees overall across the sale area. Leave the LOS alone except for non-commercial thinning only up to 9" dbh by hand and prescribed underburning. That's all it would take to open up these stands to far less density. Leave sufficient hiding cover from NCT-size trees in patches. There are high use wildlife areas. Changing multi-strata LOS to single strata LOS can be done just with NCT ing and prescribed burning. The difference between alt.s 2 & 3 for presumed HRV is minimal at best, both leaving LOS at a great deficit overall. Commercial logging would make the deficit in LOS greater.

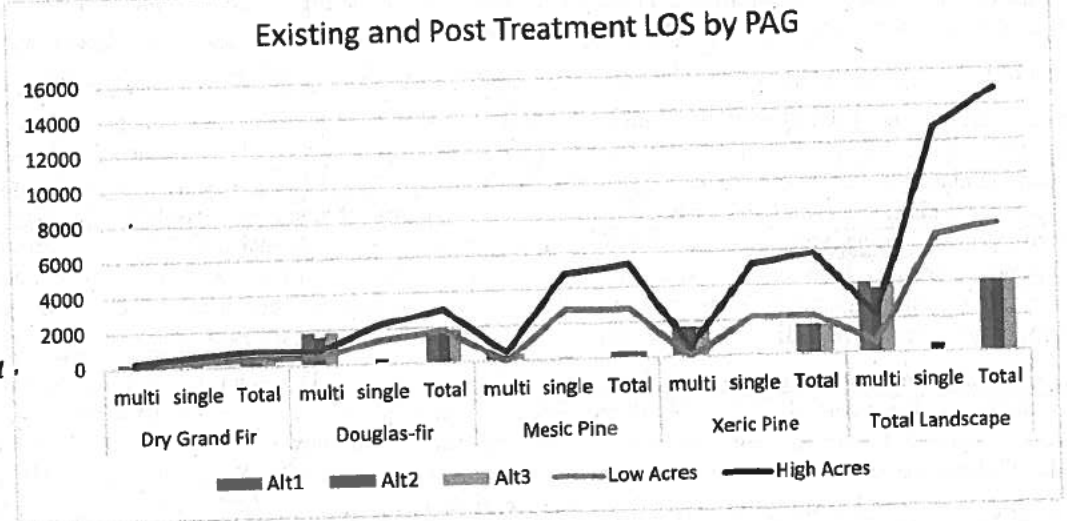
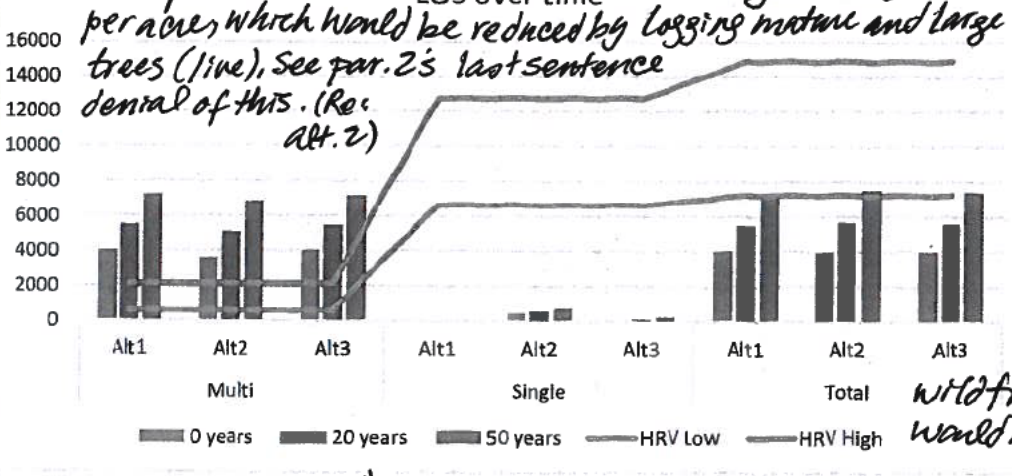


Figure 11. LOS by PAG and condition class for all alternatives immediately after treatment.

2) ⊛ The "LOS over time" graph of Figure 12 is misleading, as commercial logging of LOS usually results in LOS, because of the removal of hazard trees, large snags, and mature trees that would become large and old over time.

⊛ 3) There would be net loss of LOS from logging LOS because LOS status depends on a set number of live large trees per acre, which would be reduced by logging mature and large trees (live), See par. 2's last sentence denial of this. (Re: alt. 2)



Under extreme and rapid climate change now locked into the future, there is likely to be a great deal of thinning and reduction of green forest cover due to extreme heat waves, droughts, and wildfires. Logging LOS would make it less resilient.

Figure 12. Landscape LOS over time.

1) ⊛ The Forest Service uses the difference between single stratum and multi-strata LOS cynically to justify commercial logging that reduces old growth structure - either immediately (e.g. through felling hazard trees & snags) and/or by reducing the number of mature trees that would otherwise grow into large and old structure, which seems to be subterfuge to obfuscate the predictable result of reducing LOS structure with each timber sale

Alternative 1

Alternative 1 is the no action alternative. There would be no changes in the proportion of LOS types or departure from HRV. There will not be any improvement to landscape resilience. Multi strata LOS will continue to be over max HRV. Multi strata LOS are all stages that are at higher risk to insect and disease further discussion below.

Alternative 2

There is a proportion of the LOS multi-strata on the landscape that would require removing grand fir 21-30 inches DBH in order to move it to the LOS single. It is not most LOS multi-strata, but is does contribute to the overabundance of LOS multi-strata. This condition is approximately 101 acres within the Dry Grand Fir PAG condition classes E5a and M5a, while total LOS within the project area is approximately 3,998 acres (Figure 15). This alternative reflects the proposed removal of grand fir 21-30 inches DBH within current LOS stands to enhance LOS single strata. The treatments planned in LOS will result in restoring 401 acres of LOS to single strata (Figure 10). Removing grand fir ≥ 21 inches diameter at breast height (DBH) would not contribute to an overall reduction in LOS within the project area. There would be no net loss of LOS.

2) As par. 2 of EA p. 27 admits, most (more likely, all) LOS multi-strata is not caused by the 21-30" dbh large Grand firs that would be logged under alt. 2: "It is not most LOS multi-strata."

Re: 3)

Over the long-term Alternative 2 will develop the most LOS (Figure 12). This is a function of Alternative 2 restoring the most size class 4 (9 -21" DBH) open structure, see relative changes in E4b, M4b and L4b in (Figure 4, Figure 5, Figure 6, Figure 7). This size class will develop into new LOS fastest as the individual stands will have the fastest growth rate and trees are at a size to grow into LOS (Simpson *et al.*, 1994).

4) ⊛ The size class that would develop into LOS fastest (⊛) is 15-21" dbh, not also 9-15" dbh. (re: last sentence of p. 27)

Alternative 3

This alternative responds to a key issue by not removing any trees > 21" DBH. The treatments in this alternative will result in restoring 7 acres of multi-strata LOS to single strata. This alternative will restore fewer acres of LOS single strata than Alternative 2 (Figure 10). There would be no net loss of LOS.

Over the long-term Alternative 3 will develop more LOS than alternative 1 but less than Alternative 2 (Figure 12). This is a function of Alternative 3 restoring size class 4 open structure. This size class will develop into new LOS fastest as the individual stands will have the fastest growth rate and trees are at a size to grow into LOS.

3) ⊛ It's simply not likely that alt. 2 would "develop the most LOS" by commercially logging LOS, and since thinning of Grand fir is already happening due to climate change and loss of Grand fir in particular will escalate over time under climate change droughts, heat waves, and intense wildfires over time into the future. Some of the younger Grand firs in the mixed conifer stands are already becoming defoliated, likely due to competition for water, setting the stage for more insect defoliation as well.

Cumulative Effects Alternatives 2 and 3

1) This is the public relations propaganda that has been used for the promotion of commercial logging by the Forest Service for at least 30 years: "Fire! Insects! Disease!" ("risk")

There are no other projects within the analysis area that would have potential to affect LOS; therefore, there will be no cumulative effects to LOS from the NFCR project.

Somehow the Forest Service never acknowledges that logging is Oregon's primary contribution to CO_2 emissions.

Existing Condition – Insect and Disease Risk

Structural stages representing forest at risk to insect and disease are describe in Table 8 in the methods section above.

Table 12. Acres of high insect and disease susceptibility by alternative, with areas of key issues broken out.

	Alternative 1 Acres (percent)	Alternative 2 Acres (percent)	Alternative 3 Acres (percent)
Total Insect and Disease Risk on the Landscape	17,851 (89%)	13,066 (65%)	14,337 (71%)
Insect and Disease Risk within RHCA	2,240 (93%)	2,020 (84%)	2,229 (93%)
Insect and Disease Risk within Wild and Scenic River Corridor	1,009 (98%)	845 (82%)	986 (96%)

2) It's absurd to use some kind of blanket definition of "high insect and disease susceptibility" to designate the number of acres of "high susceptibility", so as to claim that currently 89-98% of the entire sale area, almost all of it, is at high susceptibility, to justify thinning virtually all stands.

Environmental Consequences – Insect and Disease Risk

Effects Common to All Action Alternatives

Action alternatives will reduce area at risk to insect and disease impacts by thinning stands. The indirect effect of stand density reduction is that more large trees are expected to be maintained on the landscape because thinning will reduce competition for resources, improving overall stand health, large tree vigor and individual tree growth. These conditions are known to reduce relative risk to bark beetles (Barrett, 1978). Large trees are an important component of LOS. Action alternatives reduce the percentage of the landscape that is at risk to bark beetle attack by reducing stand density within treatment units to below the susceptibility threshold, 60 percent of maximum stand density index (SDI) for ponderosa pine and mixed conifer stands (Cochran 1994). The treatments are expected to maintain stand conditions resilient to bark beetles for 20 to 30 years.

3) However, the analysis admits that: There is no need to log large trees or even small ... The analysis fails to disclose that most of the high tree density is small dbh.

Effects by Alternative

Alternative 1

Alternative 1 does not change the landscape from the current condition (Table 12). 17,851 of the forested acres in the project area would continue to be at risk of insect attacks. For the reasonably foreseeable future, dense stands would continue to become denser and increase their relative risk to bark beetle stress and mortality.

4) Susceptibility to insects and disease would be increased by commercial logging on top of past logging legacy impacts. Susceptibility also depends on moisture retention, soil integrity, etc.

There would be no change to condition in area at risk RHCAs or within the Wild and Scenic River Corridor.

Alternative 2

Alternative 2 reduces area at risk to insect and disease by 3,770 acres from the existing condition (Table 12). This is a result of all treatments proposed in alternative 2, while commercial thinning followed by non-commercial thinning and prescribed fire is the most effective treatment at the individual stand scale.

Within RHCAs there is a 20-acre reduction in area at risk. This small reduction is in part because the site-specific limitations planned within the RHCAs as described in the project design criteria. This reduction will stem from treating the full stands and not just the portions that are within RHCAs. Additionally, treatments within seral/structural stages that do not move stands to stages not at risk such as M3 for xeric pine do not show a change in area at risk.

...as if these aren't normal natural disturbances that shape the forest in ways that balance and support beneficial ecological processes. The Forest Service needs to abandon the old school forestry silviculture-driven imperative to log the forest, no matter what ecological damage is caused. It's time to stop the endless cycle of repeated logging to the point of no return, when considering the Sixth Mass Extinction and logging's major contribution to extreme climate change and the dire consequences.

*"The Forest Service is using methodologies proposed in single studies that make it (seem) possible to not have to leave the office in order to draw sweeping conclusions for particular acreage without ever looking at those acres on the ground. This is not taking a hard look at cause and effect and cumulative effects of past (and ongoing) misguided management. Characterization of the forest by "polygons" and acreage "at risk" of natural disturbances demonstrates a world view focused on resource extraction with no long-term limitation, instead of an indigenous people's view of working with wild Nature rather than against it and giving back to the forest ecosystem in reciprocity."

Within the Wild and Scenic River Corridor there is a 164-acre reduction in areas at risk. This small reduction is in part because of the limited amount of area planned to be treated within the Wild and Scenic River Corridor.

Alternative 3

Alternative 3 reduces area at risk to insect and disease by 3,613 acres from the existing condition (Table 12). This is a result of all treatments proposed in alternative 3, while commercial thinning followed by non-commercial thinning and prescribed fire is the most effective treatment at the individual stand scale.

Within RHCAs there is an 11-acre reduction in area at risk. This small reduction is in part because of the site-specific limitations on planned treatments within the RHCAs. This reduction will stem from treating the full stands and not just the portions that are within RHCAs.

Within the Wild and Scenic River Corridor there is a 24-acre reduction in area at risk. This small reduction is in part because of the limited amount of area planned to be treated within the Wild and Scenic River Corridor.

Cumulative Effects Alternatives 2 and 3

There are no other projects within the analysis area that would have potential to affect insect and disease risk; therefore, there will be no cumulative effects to this attribute from the NFCR project.

4) * By confining the scale of cumulative effects to the NFCR sale boundaries, the Forest Service is avoiding analysis of cumulative effects across the District and the Forest of boundary to boundary adjacent and nearby timber sales, repeated at about 30 year rotations or less, on a landscape scale, and at high logging intensity.

Existing Condition – Large Tree Structure

As shown above in the HRV section, overall large tree structure is underrepresented on the landscape while multi strata large tree structure is within or above HRV in all plant association groups.

Environmental Consequences – Large Tree Structure

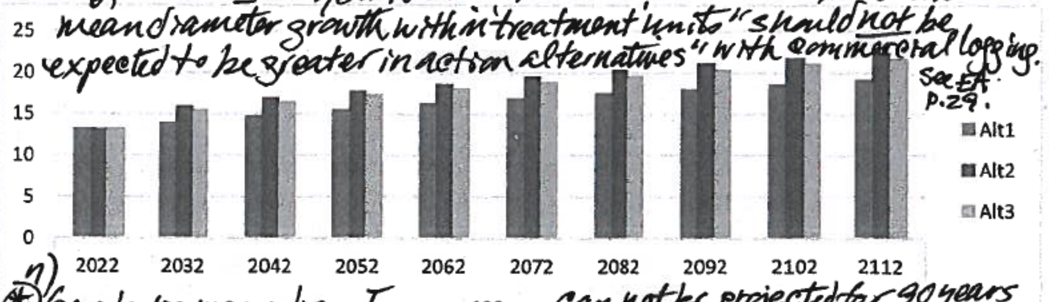
Effects Common to All Action Alternatives

Quadratic mean diameter growth within treatment units is expected to be greater in action alternatives (Cochran 1994). Stands receiving commercial treatment will develop large trees faster than the no action alternative. See Figure 13 and Figure 14 below. Figure 13 and Figure 14 are results from the representative stands within the project area. These figures demonstrate that stands in the mid seral size class 4 are best poised to grow into large tree structure; modeling of their growth following thinning shows they will reach 21" DBH sooner than under No Action and size class 5 will develop larger trees faster in treated stands than No Action.

4) * When "overall large tree structure is under-represented on the landscape" (EA p.29), there should be no logging of large trees or mature trees in LOS and protection of most mature trees (if not all) and all large trees on a landscape scale - that is, protected from logging.

* All logging terminology has now been omitted from the NEPA documents, including this EA, so that the so-called "Resilience Project" is not admitted to be a timber sale, and the word "logging" is not used, substituting euphemisms such as "thinning." This is an insidious abuse of NEPA requirements to fully disclose environmental impacts.

6) * With ≤30 year rotations for timber sales, the "Quadratic mean diameter growth within treatment units" should not be "expected to be greater in action alternatives" with commercial logging. See EA p.29.



7) * Quadratic mean diameter increase can not be projected for 90 years into the future - esp. w/ short rotation logging & extreme climate change.

Figure 13. Quadratic mean diameter of stands outside of LOS modeled results from using FVS of representative sampled stand. Stand 192 is a dry grand fir plant association mid seral size class 4 multi-strata stand (M4a).

*5) Studies from the 1990's don't take extreme climate change into consideration. The Forest Service tends to use single studies from the era of the outdated Forest Plan (e.g. Powell 1999, Simpson et al. 1994, and Cochran 1994) to justify commercial logging without regard for the implications of rapid extreme climate change and the need to maximize retention of long term carbon sequestration and storage.

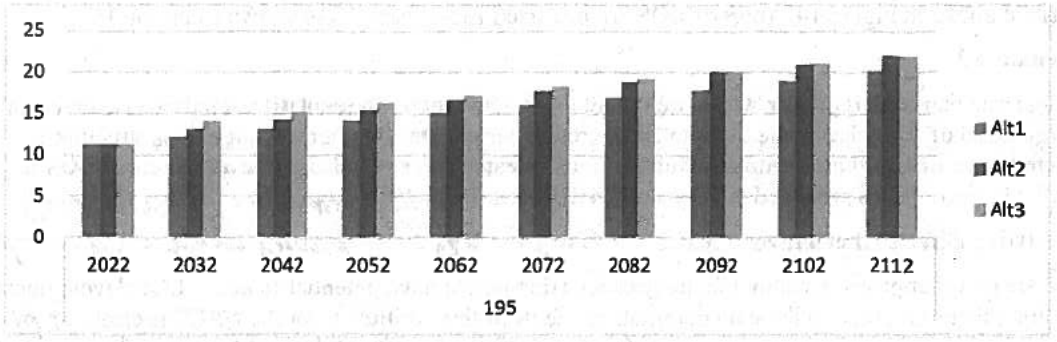


Figure 14. Quadratic mean diameter of stands inside LOS multi strata modeled results from using FVS of representative sampled stand. Stand 195 is a Douglas-fir plant association, mid seral size class 5 multi-strata stand (M5a).

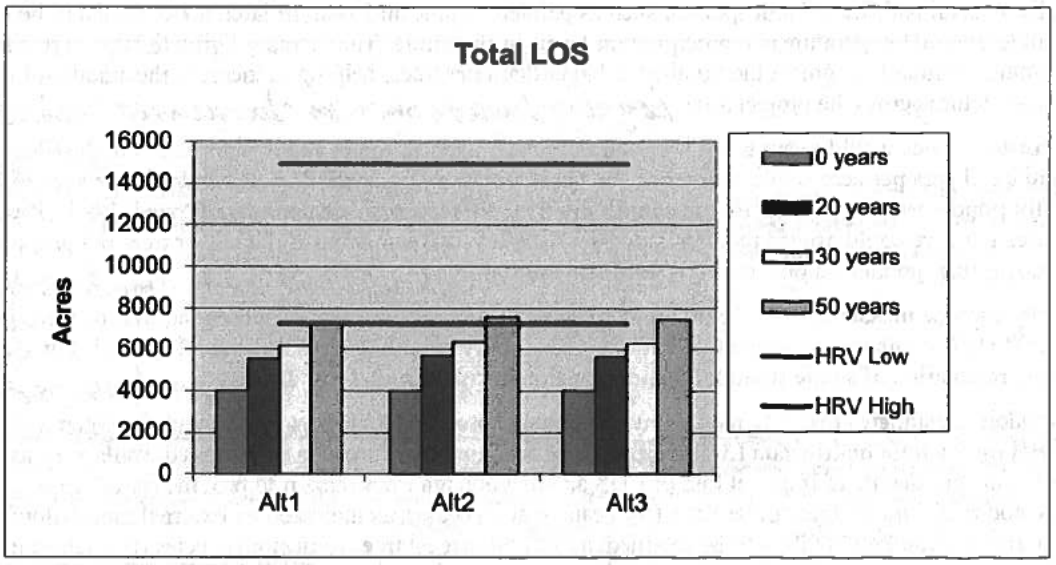


Figure 15. Development of LOS over time.

Effects by Alternative

Alternative 1

Alternative 1 does not change stand densities, stands would continue to be at risk insect and disease as described above. While quadratic mean diameter would continue to increase it would be at a slower rate than the action alternatives. These stands are also more susceptible to drought. Acres of LOS predicted in 50 years 7,248 (Figure 15). (a) Average tree diameter cannot be projected 60 to 80 years into the future when there is no way to predict the effects of natural disturbances (all exacerbated by extreme climate change) such as heat waves, droughts, wildfires, and insect epidemics, as in the prediction that alt. 2 would result in average tree dbh of 21" in 2082 to 2102. This also does not account for the effects of continued logging in rotations of 30 years or less. This is inaccurate use of the science.

Alternative 2

Average tree diameter is greater within treatment units. These two representative stands also achieve an average DBH of 21 inches in the 2082 to 2102 growth periods. Development of large trees structure is expected to be faster within treatment units than in untreated areas as represented by Alt 1. (Because large

tree structure would develop quicker, LOS would develop quicker). Landscape development of LOS is described above in Figure 14. Acres of LOS are predicted in 50 years 7,536 shown in Figure 15.

Alternative 3

Average tree diameter is greater within treatment units. These two representative stands also achieve an average DBH of 21 inches in the 2092 to 2102 growth period. Development of large trees structure is expected to be faster within treatment units than in untreated areas. Landscape development of LOS is described above. Acres predicted in 50 years 7,412 Figure 15. (*) We strongly oppose logging the forest down to only 50 sq ft. of basal area on drier pine sites, 70 sq. ft. basfor dry P. pine sites, and only 60 to 90 sq. ft. of basal area for mixed conifer. We have witnessed the near-biologically sterile results from logging to such low basal areas. Logging down to such low basal areas results in virtual clearcuts in younger stands. The intent should not be to emulate the lower density of old growth stands in young and younger-mature stands common in this sale area. This heavy logging in young stands does not allow for sufficient mortality to provide sufficient snags and logs for wildlife, and greatly reduces water retention and plant diversity.

Cumulative Effects Alternatives 2 and 3

There are no other projects within the analysis area that would have potential to affect LOS development over time; therefore, there will be no cumulative effects to this attribute from the NFCR project.

Summary of Environmental Effects

Commercial thinning would create immediate stand structure and species composition shifts towards single-strata structure and less dense stands. Proposed thinning activities would reduce inter-tree competition while providing more growing space, sunlight, water and nutrients for retained trees, increasing vigor and growth rates. Early seral and fire tolerant species, such as ponderosa pine and western larch are expected to be more resilient to altered temperature and precipitation levels in the future. The increased growth rates in retained trees would eventually augment the number of larger diameter trees, helping to increase the amount of late and old structure across the project area.

Most treated stands would retain some irregular or uneven-aged structure and age distribution. Post-harvest residual basal area per acre would range from an approximate average of 50 sq. ft. on drier pine sites to 70 sq. ft. for ponderosa pine dry; for mixed conifer dry 60 to 90 feet basal area per acre (Powell 1999). Residual basal area per acre could exceed recommended stocking levels if numerous old trees, or trees not proposed for removal (e.g. ponderosa pine over 21" DBH) are present.

Multiple resource measures were met to greater degree in Alternative 2 that proposes removal of some grand fir 21-30" DBH compared to alternative 3 that proposes only removing trees less than 21" DBH. For example, restoration of single strata LOS and reduction in risk to insect and disease.

FVS modeling estimates that Alternative 2 will remove approximately 3 grand fir per acre between 21" and 30" DBH only within multi-strata LOS stands. The actual number of trees to be removed would vary as needed to ensure that there is no net loss of LOS and that enough trees remain to provide for future snag and down wood recruitment. Trees older than 150 years of any species, as indicated by external morphological characteristics (Van Pelt 2008), will be retained, as will the largest trees of desired species (ponderosa pine, western larch, Douglas-fir).[3] (*) The "desired species" just happen to be the timber industry-preferred tree species. This is not a coincidence.

The Forest Service is not able to provide a quantification of future mortality due to drought stress, but recent studies show that the largest trees are more impacted by drought stress (Bennett et al. 2015). Stress from inter-tree competition would be an additive stress on all trees experiencing drought stress. Using density reduction (thinning) will help sustain larger trees by reducing the number of trees competing for resources.

Table 13: Summary of Effects Analysis

Resource Element	Indicator/Measure	Alt 1	Alt 2	Alt 3
Historic range of variability	Departure from HRV	29,255 acres	21,815 acres (7,440 acres reduction in departure)	23,633 acres (5,622 acres reduction)

(*) There's not many acres that even have 3 large Grand firs of 21-30+ dbh in this sale area. They certainly shouldn't be removed no matter how many large Grand firs there are per acre, since most of the historic firs were already removed by past logging. See our photos of big old growth fir stumps in mixed conifer sale units with late and old structure. Most late and old fir structure is already at a deficit[31] in natural/historic mixed conifer stands.

3) * There is not a lot of difference in outcomes projected for alternatives 2 and 3, based on Table 13, pp. 31 and 32. Given that the vast majority

of tree density is only up to about 9" dbh, there should have been an action alternative with now commercial logging with still use of non-commercial thinning up to 9" dbh and prescribed burning, as in alts. 2 & 3.

Resource Element	Indicator/Measure	Alt 1	Alt 2	Alt 3
Historic range of variability Late Old Structure	Acres of single strata (6,647 ac to 12,775 ac) vs multi strata (583 ac to 2,121 ac)	Single 7 ac Multi 3,991 ac Total 3,998 ac	Single 408 ac Multi 3,590 ac Total 3,998 ac	Single 7 ac Multi 3,991 ac Total 3,998 ac
Forest health Conditions	Acres at risk total landscape	17,851 ac	14,081ac	14,337 ac
	Acres at risk RHCA	2,240 ac	2,020 ac	2,229 ac
	Acres at risk Wild and Scenic River Corridor	1,009 ac	845 ac	986 ac
Development of large tree structure	Acres developed in 50 years	7,245 ac	7,536 ac	7,412 ac

1) * The Historic Range of Variability concept was intended to be guidance for management and not enforcement of a mandate to log and to determine exact acreage above or below HRV to lo

Eastside Screens

The Eastside screens require that a proposed timber sale and its associated watershed are characterized for patterns of stand structure by biophysical environment and are compared to the HRV. As the North Fork Crooked River project area crosses several watersheds ranging in size from 44,927acres to 51,833 acres the North Fork Crooked River project area of 37,557 acres was used as an equivalent sized landscape.

For compliance with the Eastside Screens an analysis was completed to show how any timber sales within the project area may affect the relative abundance of late old structure. This is shown in detail above in the LOS section of this report. There is no net loss of LOS in any alternative. In Alternatives 2 a portion of LOS is shifted from a condition that it is more abundant on the landscape than HRV to the condition class that is below the minimum HRV. This is in accordance with Eastside Screens Scenario A.

Trees having external morphological characteristics that suggest an age ≥ 150 years are preferentially retained in all action alternatives. In Alternative 2, some grand fir 21" to 30" DBH are removed in grand fir multi-strata LOS stands. In Alternatives 2 and 3 some timber sale activities occur within LOS closed condition in a manner to maintain or enhance LOS within that biophysical environment.

* Most Grand fir 21" to 30" dbh is old growth & shows OG characteristics.

In alternative 2 grand fir between 21inches DBH and 30 inches DBH are proposed for removal within existing LOS Multi-stratum. This would result in a change in abundance of LOS described above.

* There's hardly any Grand fir large tree density in LOS multi-strata to remove.

It is allowable to manipulate one type of LOS to move stands into the LOS stage that is deficit if this meets historical conditions (USDA Forest Service 2021 Scenario A).

5) * Given the overall deficit in LOS structure across the entire sale area, Eastside Screens Scenario A should not be used. We strongly oppose reduction of LOS structure.

There is no net loss of LOS in action alternatives.

In alternative 3 no trees ≥21 inches DBH would be removed, resulting in no change in abundance of LOS or conversion from multi-stratum to single stratum.

Stands other than LOS were first prioritized for treatment. Regeneration and group section harvest activities are not proposed in the action alternatives. Outside of LOS live trees ≥21 inches DBH and all trees having

4) * Over time LOS stands would be lost due to lack of mature trees growing into large trees due to commercial logging removing up to 21" dbh, and under 30" for Grand fir. This logging also would reduce development over time of large old growth snags &

2) * Now adherence to an assumed HRV (usually based on post-European colonization data or on stand information from a very dissimilar forest area elsewhere) makes less sense than ever, given the novel new forest growing conditions under extreme climate change effects. Yet the Forest Service is ignoring Pacific Northwest Research Station scientists on this issue and many other scientists as well who are concerned that no large trees should be logged and most or all mature forest should not be logged, to preserve to maximum carbon sequestration and storage.

external morphological characteristics that suggest an age ≥ 150 years will be retained. Except where safety during implementation requires their removal.

Fire and Fuels

This section of the EA analyzes the North Fork Crooked River project's effects related to the purpose and need for action relating to forest resiliency to disturbance events, adaptation to climate change impacts, and mitigation of the risk of wildfire spread to non-federal lands. Proposed fuel treatments within Alternatives 2 and 3 aim to meet this purpose and need by reducing uncharacteristic fire behavior of future wildfires as well as restoring the historic fuel characteristics, wildfire severity and frequency, fire behavior metrics, and species composition and structure. Descriptions of the fuel treatments within Alternatives 2 and 3 are described in Chapter 2 under Description of Activities.

Forest resiliency to disturbance events and adaptation to climate change can be measured by the potential severity of future wildfires in the form of crown fire potential and flame length as well as vegetation departure from the historic fire regime. The risk of wildfire spread to non-federal lands can be measured by the fire behavior metrics of spread rate, flame length, and crown fire potential. To quantify the potential outcomes of each alternative, this report provides the associated fire behavior and vegetation departure that are estimated to occur and assesses the implications to future fire and fuels management (Table 14).

Resource Indicators and Measures

Table 14: Resource indicators and measures for assessing effects.

Resource Indicator	Measures	Source
Fire Behavior	Flame Length, Spread Rate, and Crown Fire Activity	National Cohesive Wildland Fire Management Strategy (USDA *et al.* 2011)
Vegetation Departure	Fire Regime Groups and Condition Class	National Cohesive Wildland Fire Management Strategy (USDA *et al.* 2011)

Methodology

Analyses of the Alternatives include comparisons of fire behavior as well as vegetation departure within the project area. Together, these analyses represent the current and potential ecological deviation from the historic range of variability (HRV) along with the potential severity of future wildfires under extreme weather and fuel conditions.

Fire Behavior

Fire behavior analysis of the existing condition and effects of the Alternatives required simulation of wildfires under 97th percentile weather conditions and representative fuel conditions within the project area. The Interagency Fuel Treatment Decision Support System (IFTDSS) and LANDFIRE 2014 v 1.4.0 data were used to create 30m^2 pixel landscape models of the project area that represent the current and potential conditions in Alternative 1 as well as conditions after implementation of treatments proposed in Alternative 2 and 3. Current conditions were ground-truthed in July of 2022 to ensure accurate representation from the LANDFIRE data. Fuels edits were added within the IFTDSS "Create Landscape" tool using the geospatial polygons associated with harvest, thinning, and prescribed burning of varying intensities to alter the fuel conditions that would exist 1 year after the underburn treatment and 4 years after the thinning and pile burning treatments. These edits included the following for each of the treatment combinations:

- Commercial thin, non-commercial thin, pile burn, underburn:
    1. "Heavy thin"- 35% of the stand density remains.

2. "Light thin"- 80% of the stand density remains and trees less than 8" diameter at breast height (dbh) are removed.
3. Pile burn- all slash created from vegetation treatments is removed.
4. Low severity fire- underburn resulting in mortality of <25% of above ground vegetation.

- Non-commercial thin, pile burn, underburn:
  1. "Light thin"- 80% of the stand density remains and trees less than 8"dbh are removed.
  2. Pile burn -all slash created from vegetation treatments is removed.
  3. Low severity fire- underburn resulting in mortality of <25% of above ground vegetation.
- Underburn Only:
  1. Moderate severity fire- underburn resulting in mortality of 25-75% of above ground vegetation.

No significant changes to the fuel models took place since the LANDFIRE survey was completed in 2014, so the landscape data provided by IFTDSS did not require any additional edits.

LANDFIRE models for fire behavior within each Alternative landscape were completed using 97th percentile fuel and weather conditions from the Cold Springs Remote Automated Weather System. Table 18 shows the difference between the Alternatives under the fire behavior metrics of Flame Length, Crown Fire Activity, and Spread Rate. Together, these metrics present an idea of the severity of future fires and resistance to control. (1) (*) The LANDFIRE models used to show potential fire behavior skew the results by using 97th percentile fuel and weather conditions to make fire risk appear very high.

Vegetation Departure

Fire regimes describe the historical ecological role of fire in creating and maintaining vegetation communities for a period before Euro-American settlement activities and active fire suppression began. Fire regimes are a key component of historical range of variability (HRV) characterizations for forest and vegetation types. HRV reference conditions are also the basis for developing desired future conditions, which can be used as guidelines in developing program strategy and designing fuels restoration projects.

Fire Regime Condition Class (FRCC) is a standardized interagency tool that utilizes the concept of HRV to assess a current landscape's departure from historical (natural), or reference conditions, vegetation, fuels, and disturbance regimes (Hann et al. 2003). Table 15 shows the characteristics associated with each Condition Class. (2) (*) Fire Regime Condition Classes are flawed since they are based on comparisons with an assumed HRV that is often inaccurate or can't be known due to no pre-European colonization forest survey data or photographs.

Fire Regime Condition Classes were assessed using the Ochoco National Forest Viable Ecosystem Management Guide (VEMG) (Simpson *et al.*, 1994) which compares estimates of existing conditions and the Historic Range of Variability (HRV) of the seral/structural classes in each Plant Association Group (PAG). A crosswalk was developed by local fire ecologists and silviculturists to translate each of the VEMG PAG seral/structure classes into one of the Condition Classes (1-3). This provided the FRCC distributions across the project area and within each PAG.

Additional analysis was done to assess the more recent (within 10 years) frequency of fire and relative severities. IFTDSS' local fire history and perimeter data was gathered to find an average annual fire start and ignition source. Burn severity for large fires was provided on the Burn Severity Portal (USDA *et al.*, 2016).

(*) (3) A glaring omission in the Fire and Fuels analysis is the failure to acknowledge that the high risk of fire in the area is based on high density of only small, highly flammable trees, not the more widely spaced mature trees or the very scarce and widely spaced large trees, which are more resistant to fire due to thick trunk bark and high live crowns. Further, the Fires and Fuel analysis fails to consider the large fuel breaks between many of the forest stands of grasslands, rocky areas, and lithosol habitat (called "scablands" in the EA).

Table 15. Characteristics of fire regime condition classes.

No data	FRCC 1 Low Departure *(0-33% departure from reference conditions)*	FRCC 2 Moderate Departure *(34-66% departure from reference conditions)*	FRCC 3 High Departure *(67-100% departure from reference conditions)*
Description	Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.
Potential Risk	Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuels are similar to the natural (historical) regime. Risk of loss of key ecosystem components (e.g. native species, large trees, and soil) is low.	Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe). Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate. Risk of loss of key ecosystem components is moderate.	Fire behavior, effects, and other associated disturbances are highly departed (more or less severe). Composition and structure of vegetation and fuel are highly altered. Uncharacteristic conditions range from moderate to high. Risk of loss of key ecosystem components is high.

Table 16 shows the five possible Fire Regime Groups as characterized by the Interagency Fire Regime Condition Class Guidebook (Barrett *et al.*, 2010). These groups represent the spectrum of historical fire frequency and percent replacement severity fire. Fire regime group data specific to the project area was gathered from the LANDFIRE database utilizing the LF 2020 Remap.

Table 16. Fire Regime Groups and Descriptions.

Fire Regime Group	Fire Frequency	Fire Severity	Severity Description
I	0-35 yr	Low/Mixed	Generally low-severity fires replacing less than 25% of the dominant overstory vegetation; can include mixed-severity fires that replace up to 75% of the overstory
II	0-35 yr	Replacement	High-severity fires replacing greater than 75% of the dominant overstory vegetation
III	35-200 yr	Mixed/Low	Generally mixed-severity; can also include low severity fires
IV	35-200 yr	Replacement	High-severity fires

(*) The Fire and Fuel analysis also does not consider the implications of there being 20 wildfires in the project/timber sale area, with likely wild fire suppression of most of these fires, but also the Fox fire of 2014 burning with predominantly low severity, as disclosed on EA p. 38, with 3,190 acres unburned to low severity and 4,261 acres burning at low severity out of 9,848 acres total and only 195 acres at high severity. So this would indicate 1) a need to stop suppressing wildfires and to instead manage them by letting them burn, with oversight and steering of the fire, and 2) perhaps the highest fire severity (99th percentile) should not be used when characterizing fire "risk" in this sale area.

V	Greater than or equal to 201	Any fire severity	Moist Grand Fir, Subalpine Fir (*not present in project area)	0%
Non-vegetated	No data	No data	No data	2%

Note: Percent of Project Area are rounded numbers and therefore do not equal 100% exactly.

Within the last decade, 20 wildfires have burned within the project area: 17 from lightning, 3 from other causes, and 1 from recreation. Of these, 4 grew over 1 acre, with the Fox fire of 2014 being the largest at 9,848 acres and burning both National Forest System lands and Bureau of Land Management public lands. The severity of this fire was predominantly low with 3,190 acres unburned to low severity, 4,261 low severity, 802 moderate severity, and 195 high severity. Most of the high severity occurred within Douglas-fir stands adjacent to or within riparian habitat conservation areas (RHCAs) (USDA *et al.*, 2016).

Environmental Consequences – Vegetation Departure

Alternative 1

Continuation of the current ecological trajectory of the project area is expected to result in further deviation of all PAGs toward or into the high departure condition class (CC3) as fire continues to be excluded. Incremental increases would be expected to occur with each missed fire return interval. Ten-year projections of FRCC distributions under Alternative 1 for the entire project and each PAG are displayed in **Error! Reference source not found.**. Generally, projected acres shifted toward CC2. The pine PAGs show an increase in CC2 from CC1 acres, which is to be expected. Some of the CC3 acres are showing a shift to CC2, which is an unexpected outcome and likely an error from the lack of sensitivity of the FRCC crosswalk to fuel characteristics beyond stand structure, including surface fuel loading.

Douglas-fir PAGs are projected to have an increase in 4% of the existing condition acres into CC3, 3% coming from CC2 and 1% from CC1 acres. No significant change is projected in the Dry Grand Fir PAG.

Fuel loads across all PAGs would increase, but at varying paces and with varying fuel class densities. Douglas-fir PAGs would likely continue to develop heavy dead fuel loads (greater than 3" diameter) from self-thinning as stands become more mature and denser. Similar heavy fuel loads may be realized in all PAGs as insects and diseases spread in stressed stands. Pine PAGs would likely continue to develop finer fuel loads (less than ¼" diameter) at the surface level and experience denser understories that contribute to ladder fuels and crown fire conversion in the next two decades. Beyond that time, shade tolerant and fire-prone species like Douglas-fir and grand fir may become the dominant species, further altering the fire regime (Merchel et al., 2014).

Alternative 2

Alternative 2 proposes 5,851 acres of commercial thinning, followed by non-commercial thinning and prescribed burning. This suite of treatments is the most impactful in moving the FRCC distribution toward the desired Condition Class 1, considering the removal of shade tolerant, fire prone species in the canopy that, in most scenarios, would not have persisted if fire had continued its natural cycle (Merschel et al., 2014). This combination of treatments improves fuel loading in the canopy, understory, and surface, and sets the stage for continued maintenance and protection of investment with prescribed fire at intervals similar to the historic disturbance schedule.

Non-commercial thinning and prescribed burning are proposed on 5,214 acres under Alternative 2. Generally, this combination of activities was selected in stands that primarily needed understory thinning to reduce ladder fuel loads and prescribed fire to reduce residual activity fuels and natural surface fuel loads. Crown densities may also be beneficially impacted in these treatments, but at a lesser extent compared to treatments with commercial thinning.

Underburning not associated with any thinning is proposed on 242 acres in Alternative 2 and was selected for stands that were already at or close to desired tree densities and composition, but would benefit from surface fuel consumption, or in some cases a thin by fire, utilizing a low to moderate intensity prescribed fire.

The distribution of FRCCs across the project area and classification into PAGS can be found in **Error! Reference source not found.**. When compared to the existing condition, Alternative 2 has an increase of 24% of the project area's forested acres in the desired condition class (Condition Class 1), a reduction of 13% in Condition Class 2, and a reduction of 11% in Condition Class 3.

The Dry Grand Fir PAG had the greatest improvement toward CC1, with a 41% increase. All other PAGs had a positive shift of acres into CC1 between 13 and 28 percent.

Alternative 3

In comparison to Alternative 2, Alternative 3 was intended to reduce the commercially treated acres within RHCAs as well as eliminate the option to cut and remove trees over 21" DBH. The 1,522 acres that were within RHCA in Alternative 2 went to a non-commercial thin and prescribed fire treatment combination, and acres that had proposed selective thinning over 21" DBH in Alternative 2 remained as commercial thinning of 21" DBH and below.

While non-commercial thinning and subsequent burning reduce the ladder and surface fuel loading as well as portions of the canopy density in the RHCA, the ability to remove 21"DBH trees and above that have grown in the absence of fire and contribute to uncharacteristic fuel loading and fire intensity is eliminated. The differential treatment of RHCA and the adjacent upland forest would potentially, in time, result in separate fire regimes. A recent study of eastern Oregon forests indicates that, historically, fire regimes in RHCAs during dry years were similar to the adjacent upland forests in fire frequency (Harley *et al.*, 2020), though too much variation is associated with the severity differences to make inferences. Retention of mature species at densities outside of the HRV would likely continue to alter the structure and composition of RHCA to allow buildup of fuel and subsequent fires of undesired intensity and severity.

Selective cutting of tree species like Douglas-fir and grand fir over 21" DBH throughout all PAGs would move the species composition closer to the HRV and support the restoration of the historic fire regime, providing better conditions to allow for prescribed fire to be reintroduced without undesired effects. Elimination of this option in Alternative 3 would allow fire-intolerant species to continue to persist and propagate in PAGs that were historically dominated by ponderosa pine.

The distribution of FRCCs across the project area's forested acres and classification by PAGS under Alternative 3 is estimated in **Error! Reference source not found.**.

Across the project area, Alternative 3 is estimated to have an improvement of 17% in Condition Class 1 compared to the existing condition, but 7% less of an improvement compared to Alternative 2. Condition Class 2 is improved by 9% compared to the current condition, but 4% less of an improvement than Alternative 2. Condition Class 3 was improved by 8% compared to the current condition, which is a 3% less if a reduction compared to Alternative 2.

The Douglas-Fir PAG was the most impacted by the treatment differences in Alternative 3, with 16% less of a reduction in CC1 acres compared to Alternative 2. The Dry Grand Fir PAG also had 4% less of a reduction in CC3 and 11% less acres converted to CC1. The greater differences in the fir PAGs are likely due to the 21" DBH change in treatment as a greater number of firs would be thinned in Alternative 2. ✱ It's unlikely that logging large Grand firs 21"-30" dbh under alt. 2 would have much effect on fire intensity and spread, as there are very few Grand firs remaining in this size class from past high grading and the remaining 21-30" dbh Grand firs have visual old growth characteristics that make the large Grand firs more resistant to fire, with thick trunk bark and high fire crowns. Further, large Grand firs exhibiting old growth characteristics are not supposed to be logged in this sale.

Existing Condition – Fire Behavior

Flame Length

Simulated fire activity under current conditions produced moderate flame lengths in almost all acres of the project area Table 18. Flame lengths under 4 ft generally provide firefighters the opportunity to suppress wildfires from the ground level; approximately 64% of the project area is modeled to produce these flame lengths. Aerial suppression activity such as bucket delivery of water from helicopters or fire-retardant

delivery via air tanker become increasingly necessary to suppress wildfires with flame lengths over 4 ft. The project area is modeled to have these flame lengths in 36% of the acres.

Rate of Spread

Spread rate was also modeled as predominantly moderate under current conditions. The lower spread rates (between 0 and 5 chains per hour) generally allow suppression resources ample time to suppress wildfires and prevent fire perimeters from growing undesirably large. Thirty-nine percent of the project area is simulated to produce this type of fire behavior. The remaining 61% is simulated to produce spread rates from 5-50 chains(ch) per hour, which becomes increasingly difficult for suppression resources to catch wildfires at low acreage, when desired. Additionally, spread rates of 5-50 ch/hr increase the likelihood of spread across Forest Service boundaries.

Crown Fire Activity

Crown fire activity simulations across the project area resulted in 86% surface fire, which is the desired fire behavior. Surface fires allow for primarily ground-based suppression activities. Aerial suppression activities are more likely needed with crown fire behavior, which 13% the project area is modeled to produce. Specifically, these areas are likely to exhibit passive crown fire activity, meaning single or grouped trees experience fire in the crowns in conjunction with surface fire spread. This type of crown fire activity increases the likelihood of spread onto non-Forest Service land.

Environmental Consequences – Fire Behavior

Alternative 1

Future conditions under Alternative 1 would likely have increased acres of flame lengths over 4 ft, rate of spread over 5 ch/hr, and passive or active crown fire for many of the same reasons as mentioned in the Vegetation Departure section above, e.g., surface and ladder fuels continue to increase, and canopies become denser with fire intolerant trees.

Of greatest concern, the fuels along the forest boundary would move toward a higher likelihood of fire spread. The 2014 Crook County CWPP indicates that the Paulina Risk Assessment Area, which includes the project area, has a moderate rating for Values at Risk including critical road systems that provide some of the only access to and from the Ochoco National Forest, utility lines that provide resources to the town of Paulina and surrounding ranches, and multiple communication sites for the USDA Forest Service, DOI Bureau of Land Management, and Oregon Department of Forestry.

Highly Valued Resources or Assets (HVRAs) identified by Ochoco National Forest Resource Specialists to be within the project area include the following:

- Timber Products
- Late and Old Structure Forests
- Wild and Scenic River Corridor
- Dispersed Recreation
- Threatened and/or Endangered Species
- Fish Bearing Streams
- Goshawk and Other Raptor Habitat
- Range Allotments, Fences, and Water Features
- Riparian Habitat Conservation Areas
- Old Growth Management Area
- Visual Corridors

(*) The "Highly Valued Resources or Assets" list looks like it was meant to encompass all of the National Forest, or at least all of the North Fork Crooked River proposed timber sale area. The Forest Service uses an outdated Smokey the Bear public relations stance of preventing wildfire, which seems no longer even possible under extreme climate conditions. The Forest Service doesn't seem to care about protecting existing Late and Old Structure forest, Wild and Scenic River corridors, dispersed recreation, Threatened and Endangered Species, fish bearing streams, goshawk and raptor habitat, RHCAs, old growth Management Areas, and Visual Corridors - unless the "risk" of wildfire creates a rationale for commercial logging. The agency wants to log the forest, not protect it, in practice. The EA fails to consider the restorative natural benefits of wildfire to all the above listed components of the forest ecosystem - especially due to decades of human wildfire suppression.

Alternative 2

The fuel treatments associated with Alternative 2 are estimated to reduce fire behavior across all metrics (Table 18). Acres of the project area with flame lengths below 4 feet are estimated to increase by 7%. However, the 0-1ft flame length category was reduced by just 1% which could be a result of some of the acres transitioning to grass fuel models as competition from trees is reduced and solar radiation, soil nutrients, and water increase in availability. The temporary increase in flame length would persist until the grasses are replaced with trees and shrubs through ecological succession.

Crown fire activity in the surface fire category is estimated to increase by 4%, decreasing the acreage in the passive crown fire category. Spread rates are estimated to follow the same trend with 9% more acres observed in the 0-5 ch/hr category, though there is a 1% increase in 0-2 ch/hr spread rates likely due to similar reasons as the flame length metric (grass fuels models generally have higher rates of spread).

The reduction in flame lengths, transition from passive crown fires to surface fires, and decreased rates of spread would mean increased suppression potential for firefighters, reduced reliance on heavy machinery and aircraft, and less of an economic impact when wildfires occur. This is inherently beneficial in scenarios where wildfires threaten HVRAs such as the ones identified above by forest specialists and where fires threaten to spread across forest boundaries.

(*3) Livestock grazing is overgrazing likely violating grazing standards if it is necessary to rest pastures from grazing prior to under-burning as there may not be adequate fuel for fire spread." (EA p.41) The Forest Service needs to take heed of livestock overgrazing information & change livestock grazing.

Alternative 3

Treatments associated with Alternative 3 are modeled to have the same impacts as Alternative 2, with slightly less acres going into the low fire behavior categories (Table 18). The lack of any significant changes from Alternative 2 to Alternative 3 is likely due to the bluntness of the IFTDSS fuels edits. With the edits only able to differentiate thinning based on percent of the remaining stand and not the size and/or species, fire behavior differences will only be detectable in the RHCA acres, which are not a significant part of the project area and elicit very little change.

Anticipated impacts based on professional opinion include a slightly lesser change in crown fire activity from passive to surface fire in Alternative 3 compared to Alternative 2, since fewer large trees would be thinned and taken out of the canopy continuity and density. Even less significant but noteworthy, the categories of flame lengths between 0 and 2 feet and spread rates under 2 ch/hr would likely have greater acres compared to Alternative 2, since fewer acres would be temporarily transitioned to a grass fuel model.

Implications to suppression, risk to highly valued resources and assets, and risk of wildfire spread across forest boundaries largely remains the same in Alternative 3.

(*) Cumulative effects analysis for Fire and Fuels for livestock grazing is flawed in that is documented that livestock grazing does not improve fire behavior metrics as claimed on EA p. 41, but instead increases fire intensity and spread by encouraging the in-growth of small flammable trees in the absence of substantial grass and forb cover, reducing competition of seedlings with grass and forb cover. This is quite evident in the sale units, with dense, unimpeded tree seedlings and saplings that form the greatest source of high flammability.

Cumulative Effects

Grazing

Grazing activity will continue to occur throughout all allotments within the project area in all Alternatives. Expected impacts include removal of grasses and some shrubs, which can maintain CC1 characteristics or move CC2 or CC3 conditions closer to CC1. Fire behavior metrics are also improved by grazing, as less grass and shrubs likely lead to less surface and ladder fuels available for larger flame lengths, faster spread rates, and conversion of surface fires to crown fires. Under Alternative 1, grazing may be the only consistent, managed disturbance that serves to reduce fuel loading and continuity. With Alternatives 2 and 3, however, grazing may impede the desired effects of the underburn activities if it takes place within the year prior to underburn implementation as there may not be adequate fuel for fire spread. Close coordination between fuels specialists, range specialists, and permittees will be required in the year prior to underburn implementation under Alternatives 2 and 3, so that at least one year of rest is observed prior to the underburn.

Invasive Annual Grass Spread

Ongoing invasive treatments are expected to occur throughout the project area. The species of greatest concern to fuels and fire management is *Ventenata dubia* due to its ability to invade scablands that typically serve as fuel breaks in wildfire and prescribed fire activities. The increase of invasion of *Ventenata dubia* would likely increase flame lengths over 2ft and spread rates over 5 ch/hr. For all Alternatives, the introduction of *Ventenata dubia* into new areas would likely mean the removal of other native species which

(*2) Commercial logging-related ground disturbance would increase Ventanata dubia dispersal and concentration, increasing fire intensity and threatening native plant biodiversity and viability.

Total	2	9,456	47	9,682	48	+1	6,794	34	-13	7,607	38	-9
Total	3	10,159	50	10,118	50	0	7,963	39	-11	8,417	42	-8

Table 19. Summary comparison of Fire Behavior for Alternatives 1-3. Percent changes are based on comparison to the Existing Condition. [2]

Fire Behavior	Existing (Alternative 1)		Alternative 2			Alternative 3		
Flame Length (ft)	**Acres**	**%**	**Acres**	**%**	**% (+/-)**	**Acres**	**%**	**% (+/-)**
Non-Burnable	691	2	691	2	0	691	2	0
0-1	1,164	3	950	2	-1	1,116	3	0
1-4	22,053	59	25,239	67	+8	25,034	67	+8
4-8	11,962	32	9,772	26	-6	9,811	26	-6
8-11	38	0	26	0	0	26	0	0
11-25	1,366	4	659	2	-2	660	2	-2
25+	277	1	213	1	0	213	1	0
Crown Fire Activity	**Acres**	**%**	**Acres**	**%**	**% (+/-)**	**Acres**	**%**	**% (+/-)**
Non-Burnable	691	2	691	2	0	691	2	0
Surface	32,154	86	33,740	90	+4	33,739	90	+4
Passive	4,705	13	3,118	8	-5	3,119	8	-5
Active	2	0	2	0	0	2	0	0
Spread Rate (ch/hr)	**Acres**	**%**	**Acres**	**%**	**% (+/-)**	**Acres**	**%**	**% (+/-)**
Non-burnable	691	2	691	2	0	691	2	0
0 - 2	3,494	9	3,133	8	-1	3,418	9	0
2 - 5	10,534	28	14,333	38	+10	14,109	38	+10
5 - 20	12,265	33	9,698	26	-7	9,642	26	-7
20 - 50	10,565	28	9,695	26	-2	9,690	26	-2
50 - 150	1	0	1	0	0	1	0	0
150+	0	0	0	0	0	0	0	0

1) ⊛ Table 19 actually shows that most fire behavior in the existing condition is mostly short flame lengths (e.g. 1-4 feet over 22,053 acres), mostly preferred surface fire (over 32,154 acres) and mostly low spread rate. This indicates that commercial logging is not needed (not that commercial logging actually reduces fire intensity & severity) to reduce fire intensity, crown fires, and spread rate. Noncommercial thinning and prescribed underburning should be enough to maintain low intensity surface fire with less spreading.

Wildlife

The Wildlife Report is fully incorporated into the EA, except for Appendices A-E, which can be found in the project record. This section addressed the potential effects to Threatened, Endangered, and Sensitive Species (TES), Management Indicator Species (MIS), Other Species Identified in the Forest Plan, Connectivity Corridors, and Birds of Conservation Concern. Project activities have potential to affect wildlife habitat in the following ways:

This portion of the EA addresses the following issues:

2) ⊛ Why are critical parts of the wildlife section of analysis kept out of the EA, with Appendices A-E only available in the project record, which most of us cannot access in a timely manner? We have no way of knowing if the wildlife biologists' concerns are omitted in the EA summaries, and what may have been considered in the full wildlife reports that were dismissed and left out of the EA. This applies to the entire core issues addressed in the wildlife reports. See the 1st par. under "Wildlife" on EA p. 43.

[2] Table 18 and 19 were modified to meet 508 compliance. The gray tones are showing light gray being least impactful and dark grey being most impactful.

endangered, and proposed terrestrial species for the Ochoco National Forest and states whether individual species were considered for further analysis.

Table 21: Threatened, endangered, proposed, and sensitive species for the Ochoco National Forest and Crooked River National Grassland: occurrence within the North Fork Crooked River project area and consideration of potential for impact.

Species	Species Occurrence in the Project Area and Consideration of Potential Impact for Further Analysis
Endangered	
gray wolf *Canis lupus*	**Considered.** This species is currently known to utilize the analysis area as dispersal habitat, but is not known to occupy it, or the Ochoco National Forest, on a permanent basis. No Areas of Known Wolf Activity, den sites, or rendezvous sites are designated within or adjacent to the project area. Proposed project activities such as commercial harvest, prescribed fire, etc. are included activities within dispersal habitat in the 2020 gray wolf programmatic BA. Potential exists for prey species to be impacted by project activities.
Proposed	
wolverine *Gulo gulo*	**Considered, but not carried forward.** Species is not known or suspected to occur within the analysis area. Surveys have not detected presence of this species on the Forest. Suitable habitat in the form of isolated areas with consistent snowpack does not occur within the analysis area; therefore, no impacts from project activities are anticipated to this habitat.
Region 6 Sensitive Species	
white-headed woodpecker *Picoides albolarvatus*	**Considered.** Species is known to occur within analysis area. Proposed actions would impact live trees within ponderosa pine habitats and therefore may impact this species or its habitat.
Morrisoni bumble bee *Bombus morrisoni* and **western bumble bee** *Bombus occidentalis*	**Considered.** Two western bumble bee observations are documented from the project area, while Morrisoni bumble bee has not been documented during surveys. Habitat is present in the form of riparian areas, moist meadow, and other areas where flowering plants occur throughout the year. Potential exists for flowering vegetation within riparian and moist meadow habitat to be impacted by project activities.
Lewis's woodpecker *Melanerpes lewis*	**Considered, but not carried forward.** Species may occur in riparian habitats or burned areas within the analysis area, though no observations have been documented. Minimal burned habitat is present in the project area. Riparian habitat components necessary for suitable reproductive habitat for this species such as large-diameter cottonwood are not present in large quantities within the analysis area. In addition, any potential impacts from proposed activities within riparian corridors will be mitigated due to Resource Protection Measures that limit removal of snags, and thus no anticipated adverse changes in habitat or species use of the area will occur.
silver-bordered fritillary *Boloria selene*	**Considered, but not carried forward.** Species is not known or suspected to occur within the analysis area. The host plant, bog violet, has not been documented within the project area. Surveys did not confirm occupancy, but habitat is present in the form of riparian areas, moist meadow, and other areas where flowering plants could occur. No measurable impacts from project activities are anticipated due to Resource Protection Measures that protect habitat for Peck's mariposa lily, meadows, and other sensitive plant habitat, and thus no anticipated adverse changes in habitat or species use of the area will occur.
monarch butterfly *Danaus plexippus*	**Considered, but not carried forward.** Species is not known or suspected to occur within the analysis area. The host plant, milkweed, has not been documented within the project area and surveys did not document the presence of this species. No measurable impacts from project activities are anticipated due to Resource Protection Measures that protect meadows and other sensitive plant habitat, and thus no anticipated adverse changes in habitat or species us of the area will occur.

There are approximately 376,000 acres of available habitat for the gray wolf on the Paulina Ranger District. Within the North Fork Crooked River project area, approximately 37,557 acres of suitable habitat exists, as well as abundant prey in the form of deer and elk.

Environmental Consequences – Gray Wolf

Alternatives 1, 2, and 3

Wolves are not known to reside on the Ochoco National Forest. Therefore, no effects are anticipated to established packs, dens, or rendezvous sites, as they are not known or suspected to occur on the Forest, or within the North Fork Crooked River project area. However, the project area serves as dispersal habitat for transient wolves. Effects to dispersing wolves were evaluated based on changes in the following criteria: 1) human use, 2) barriers to movement, and 3) prey availability. In addition, the duration and exposure to potential effects were evaluated.

Roads and trails that are present across the Forest, including within the project area, facilitate a high amount of human disturbance to potential wolf habitat. Alternative 1 does not remove human disturbance from the area, nor does it add to the existing ambient disturbance already present. All action alternatives include an increase in human use of the area in the short-term as restoration activities occur. In the mid- to long-term a reduction in open road density may reduce human disturbance in the area.

There are no proposed activities which might serve as a barrier to movement for gray wolves. Proposed actions do not create a physical barrier for this species, and therefore the ability of the species to maneuver through the landscape would not be impeded by any proposed action under any alternative.

This project is not expected to significantly affect distribution or population size of prey species for wolves to such a degree that prey would be unavailable for the needs of the species under any of the alternatives. While prey species such as deer and elk may modify their habitat use during implementation, activities generally occur only on portions of the project area at a time and there is abundant habitat outside the project area where dispersing wolves may find prey. It is expected that the abundance and distribution of forage, security habitat, core habitat, and parturition habitat for elk and deer would likely increase throughout the project area, while hiding cover would likely decrease. In the short-term prey such as elk and mule deer may be displaced to other nearby areas, which in turn may encourage wolves to occupy those same habitats as they disperse through the area. For a more detailed explanation of effects to big game species see "Rocky Mountain elk and mule deer" in the management indicator species section.

Therefore, due to the scope and scale of the project, the abundance of suitable habitat located in close proximity to proposed activities, the limited duration of potential disturbance and exposure, and the lack of detrimental effects to prey species, any potential effects to wolves dispersing through the project area would be insignificant and discountable.

Cumulative Effects

The cumulative effects boundary includes portions of the 2 watersheds that fall within the North Fork Crooked River project boundary (Wildlife Appendix A, Figure A-1 in the project record). All the past, present, and reasonably foreseeable future actions in Wildlife Appendix A, Table A-1 (in the project record) were considered for their cumulative effects to the gray wolf and its habitat.

Currently there are no other projects in the planning or implementation phase within the analysis boundary that include commercial thinning or vegetation management treatments. All previous treatments are included as part of the existing condition.

Livestock grazing as authorized by the Big Summit, Deep Creek, Fox Canyon, Little Summit, North Fork, Roba, and Wolf Creek AMPs is ongoing within the cumulative effects boundary except for a few exclosures. Proposed activities such as adaptive management and pasture rotation have improved grazing management and conditions of the habitat, thus providing more forage for big game as well. Effects from these actions would contribute beneficially toward habitat conditions for the gray wolf and its prey.

"* There is no detailed analysis in the wolf section as to the extent of foreseeable loss of hiding cover (and with commercial logging, thermal cover) for elk and deer, the main prey of wolves. Nor is the intensity of hiding cover loss disclosed regarding longer-term effects to elk and deer, and the potential loss of thermal cover from commercial logging from both alternatives over the long-term. It is not just a short term impact during management implement-ation that is of concern for elk, deer, and wolves, but longer-term impacts from loss of hiding and thermal cover. Mule deer are already in decline and we didn't see much evidence of elk in the sale units. Dispersing wolves need to be able to find available prey and use hiding cover for security during hunting season and otherwise - from human predators.

* Potential for livestock conflicts should be considered.

* The cumulative effects analysis for wolves should have included discussion of high potential for wolf mortality due to livestock conflicts in an area with 7 (seven) grazing allotments within the cumulative effects boundary. Loss of hiding cover could increase shooting of wolves

1) ✱ more flaws in the analysis re: the "Determination" for wolves: Extensive loss of hiding cover could eliminate the suitability of existing source habitat regarding loss of prey use. Further, wolves are not exclusively diurnal nocturnal. My one sighting of a wolf in the Ochoco NF was in broad daylight in the middle of a summer afternoon, who was stalking a Pronghorn in the Black Mountain sale area.

Determination

Activities associated with the implementation of the North Fork Crooked River alternatives would not impact established wolf packs, dens, or rendezvous sites as no populations currently occupy the Ochoco National Forest, nor are there any areas of known wolf activity (as identified by ODFW) on the Forest. In addition, the Ochoco National Forest does not meet the USFWS definition of occupied wolf range, where potential impacts to the species should be considered. Wolves dispersing across the project area would not be inhibited by the implementation of this project, as no physical barriers are proposed. The potential for disturbance to dispersing wolves is considered low because both documented and suspected use of the project area by wolves is infrequent in nature. In addition, suitable source habitats and diurnal patterns of human use provide relief should a dispersing individual's movements be influenced by human activities. This project does propose to increase human use above existing levels, however proposed activities would likely occur during daylight hours and would therefore not be expected to impact species potential use of the area. Effects to prey species from project implementation may cause minor shifts in distribution seasonally, however these impacts are insignificant at the landscape scale and would not impact population levels or viability and are therefore discountable. Therefore, the determination for wolves is **May Effect, not Likely to Adversely Affect (NLAA)** for all action alternatives. In addition, on March 17, 2020 the Forest received concurrence from the USFWS that implementation of numerous activities (including vegetation management, prescribed burning, and other restoration actions) with associated Resource Protection Measures is not likely to adversely affect the gray wolf (USFWS 2020).

✱ The Determination for Gray wolves should not be made by the USFWS, as they are one of the biggest sources of wolf mortality due to killing wolves due to livestock conflicts.

Existing Condition – White-headed woodpecker *(Picoides albolarvatus)*

White-headed woodpeckers are known to utilize the Ochoco National Forest, and as documented in other areas, are associated with open canopy stands of large-mature and over-mature ponderosa pine, and less frequently associated with mixed ponderosa and Douglas-fir stands (Ligon 1973, Cannings 1995, Buchanan et al. 2003).

2) ✱ We agree that: (quote below)

4 Past management actions including the exclusion of frequent low- and mixed-severity fire, intensive grazing, and widespread harvest of large fire-tolerant trees have increased the density of small trees, elevated fuel loads, increased risk of crown fire, accelerated mortality of large, old trees, and homogenized fire-prone/fire-adapted forests compared to historic conditions." Predictive modeling using Viable (Simpson et al. 1994) indicates the Historic Range of Variability (HRV) for white-headed woodpecker habitat would have been between 8,703–17,168 acres in the project area. Currently, 1,991 acres exist, which is below the HRV.

Environmental Consequences – White-headed woodpecker

Alternative 1

This alternative would not treat forested stands. Habitat for white-headed woodpecker would be unchanged and remain below the HRV under this alternative. The existing acres of fir-dominated understories and the trend toward fir-dominated habitats would continue unabated, leading to a continued decline in open pine-dominated stands. Mortality of large ponderosa pine due to stand densities being above sustainable levels would likely result in loss of habitat for white-headed woodpeckers as the overstory pine trees succumb to stress from competition in overstocked stands.

3) ✱ Alt. 2 would have an adverse effect to white-headed woodpeckers by removing 15-21" dbh Ponderosa pines that would otherwise be able to grow into large trees, large and old Ponderosa pines suitable for white-headed woodpecker source habitat.

Alternatives 2 and 3

Alternatives 2 and 3 would reduce the understory fir component on acres dominated by ponderosa pine and increase the abundance of more open stand structure with ponderosa pine contributing a relatively larger percentage of the species composition. All action alternatives would increase white-headed woodpecker habitat within the project area immediately following treatment (Table 22).

Under Alternatives 2 and 3, commercial treatments would have beneficial impacts to habitat in the short- to mid-term, though there may be an isolated adverse impact to individuals during implementation due to disturbance.

Yet this negative effect to White-headed woodpeckers is not disclosed or considered for effects of alt. 2 in the analysis.

1) ✱ We support small tree non-commercial thinning only up to 9" dbh by hand in RHCAs, as well as allowing prescribed fire to back into RHCA but we are strongly opposed to commercial logging in RHCAs, which would threaten the Western Bumblebee and any Morrisoni Bumblebees more than non-commercial thinning and burning due to more ground disturbance, since they primarily nest underground

Table 23: Acres of treatment by type in potential bumble bee habitat.

Alternative	Commercial Thinning[1]	Non-Commercial Thinning[2]	Prescribed Burning[3]	Total Area
Alternative 2	34	37	6	77
Alternative 3	13	58	6	77

1: Includes subsequent non-commercial thinning and fuels treatment on those same acres.
2: Includes only those acres outside of commercial harvest units, but does include subsequent fuels treatment on those same acres.
3: Includes only those acres outside of commercial and non-commercial units.

2) ✱ Again, cumulative effects analysis must include in-depth and specific analysis of previous causes of long-term and mid-term cumulative effects.

Cumulative Effects

The cumulative effects boundary includes portions of the 2 watersheds that fall within the North Fork Crooked River project boundary (Wildlife Appendix A, Figure A-1 in the project record). All the past, present, and reasonably foreseeable future actions in Wildlife Appendix A, Table A-1 (in the project record) were considered for their cumulative effects to bumble bees and their habitat. ✱ 3) For instance, has there been past management actions (such as past overstory logging & wild fire suppression that in combination with livestock grazing (which is mentioned), as well as past insecticides use that may have eliminated suitable meadow and riparian habitat for the bee species (yes) and any past killing of bees from insecticides used for defoliating insects? Causes of cumulative effects cannot be legitimately swept under the rug as part of the existing condition.

Currently there are no other projects in the planning or implementation phase within the analysis boundary that include commercial thinning or vegetation management treatments. All previous treatments are included as part of the existing condition.

Livestock grazing as authorized by the Big Summit, Deep Creek, Fox Canyon, Little Summit, North Fork, Roba, and Wolf Creek AMPs is ongoing within the cumulative effects boundary except for a few exclosures. Grazing animals can decrease flower and seed production, directly consuming reproductive structures, or indirectly by stressing plants and reducing the energy available to develop seeds (Wallander et al. 1995, Lacey et al. 1992). The continued implementation of livestock grazing in the watersheds is likely reducing the abundance and quality of habitat for these species.

We agree that " ✱ "

Determination

The determination of effect of the action alternatives on the western bumble bee and Morrisoni bumble bee is **May Impact Individuals or Habitat, but not likely to result in a trend toward federal listing or loss of viability of the species or populations (MIIH)** due to disturbance or displacement of individuals during implementation and the minor reduction in habitat quality in the short-term.

Existing Condition – Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle is heavily associated with aquatic habitats and a majority of their diet is fish, however they also consume carrion, waterfowl, and small mammals. Nests are typically located in large trees or snags in close proximity to water (Csuti et al. 2001). Habitat loss and human activities that adversely affect the suitability of breeding, wintering, and foraging areas continue to be the most significant long-term threat to bald eagles (USFWS 1986).

There are no current or historical records of bald eagles nesting within the project area and there are no identified Bald Eagle Management Areas or Eagle Roost Management Areas in the project area. Suitable nesting and roosting habitat for the bald eagle is present within the project area in the form of large trees that could serve as perch trees, roost sites, or potential future nest sites. Additionally, the North Fork of the Crooked River bisects the planning area and may provide an adequate prey base for the bald eagle. (see EA p. 53, 2nd par.)

Environmental Consequences – Bald Eagle

Alternative 1

Under this alternative no activities would be implemented that would affect bald eagles or their habitat within the project area. There is potential for an increased risk of loss of habitat due to future wildfire intensity or extent due to retention of existing fuel loads and continuation of fuel development and

mostly confined to a class 1 RHCA along the North Fork Crooked River Scenic Corridor. Both action alternatives propose various amounts of individual treatments but occupy roughly the same overall footprint. In the short-term proposed activities may adversely impact individuals or habitat through the disturbance of vegetation where fuels reduction activities occur, but these impacts would be temporary. Over the mid- to long-term, treatments would maintain increased levels of open forest with herbaceous and shrubby understory plants, as well as meadow habitat, potentially increasing insect species to forage upon.

Resource Protection Measures identified to minimize impacts to meadows and riparian areas as well as those retaining snags would also serve to limit adverse impacts to these species. Direct removal of snags is not part of the purpose and need for this project, nor is it identified as a proposed activity in any alternative. A small amount of dead wood may be adversely impacted during thinning or prescribed fire operations. However, no measurable impacts are anticipated to current snag densities as a result of implementing any proposed alternative. Future snag recruitment may be diminished to some degree in areas where proposed treatments to reduce competition occur, however retained trees will grow larger over time and thus are more likely to provide larger snags in the future.

Fuels treatments from the North Fork Crooked River project may influence the distribution of these species as certain areas may be avoided during implementation due to effects from smoke. These treatments would not be burned simultaneously or in a contiguous block, so refugia would exist across the project area where bats would be expected to persist.

Cumulative Effects

The cumulative effects boundary includes portions of the 2 watersheds that fall within the North Fork Crooked River project boundary (Wildlife Appendix A, Figure A-1 in the project record). All the past, present, and reasonably foreseeable future actions in Wildlife Appendix A, Table A-1 (in the project record) were considered for their cumulative effects to golden eagles and prairie falcons and their habitat.

Currently there are no other projects in the planning or implementation phase within the analysis boundary that include modification to rocky habitat or vegetation management treatments in areas adjacent to any such habitat. All previous treatments are included as part of the existing condition.

Therefore, the combined effect of the proposed action alternatives from the North Fork Crooked River project, with these current and reasonably foreseeable actions is not likely to have a negative effect on habitat for Townsend's big-eared bat, spotted bat, or fringed myotis at the cumulative boundary scale.

Determination

The determination of effect of the action alternatives on the Townsend's big-eared bat, spotted bat, and fringed myotis is **May Impact Individuals or Habitat, but not likely to result in loss of viability or a trend toward federal listing (MIIH)** due to disturbance or displacement of individuals during implementation and minor reduction in habitat quality in the short-term. Overall, impacts would be minimal because of the limited amount of potential habitat in the project area.

Existing Condition – Fir Pinwheel (*Radiodiscus abietum*)

The fir pinwheel is associated with rocky ground in moist mixed-conifer forest and broadleaf riparian habitats (Blevins et al. 2017). This species prefers mesic sites near permanent water or near the base of slopes, and has been found in relatively closed-canopy forest with forbs or deciduous shrubs present. In Oregon, fir pinwheel occur in forested areas near creeks and seeps from talus slopes or under cottonwood leaf litter. Aspen and alder often provide a good secondary canopy for this species' preferred habitat (Hendricks 2012). They feed on organic detritus in the soil and on mold and bacteria from the surfaces of leaves.

Terrestrial mollusks are generally sensitive to temperature and moisture extremes and have limited mobility and dispersal capabilities. Landscape modifications that result in fragmented forests and extensive road systems can negatively affect this species' habitat and connectivity. Drying of sites from intensive logging or thinning practices, as well as habitat alteration from grazing, often leads to population declines or extirpation.

disturbance or displacement of individuals during implementation and the minor reduction in habitat quality in the short-term.

Management Indicator Species

Management indicator species (MIS) are species selected because their welfare is presumed to be an indicator of the welfare of other species using the same habitat or whose condition can be used to assess the impacts of management actions on a particular area, or other species of selected major biological communities. Management indicator species are selected from several categories including State or Federal Threatened or Endangered species lists; species commonly hunted, fished, or trapped; non-game species of special interest; and species with special habitat needs that may be influenced significantly by planned management programs. Table 25 lists the terrestrial species selected as MIS in the Forest Plan. The National Forest Management Act of 1989 (NFMA) directs the Forest Service to provide habitat to maintain viable populations of existing native and desired non-native vertebrate species.

Viability of MIS was assessed using the Historic Range of Variability (HRV) concept; comparing current amounts and distribution of habitat to historical conditions (Wisdom et al. 2000, Suring et al. 2011). By managing habitat within HRV it is assumed that adequate habitat would be provided because species survived those levels of habitat in the past to be present today. The greater departure of current habitat conditions from HRV, the more likely it is that population viability would be compromised.

Table 25: Management indicator species identified in the Ochoco National Forest Land and Resource Management Plan for the Ochoco National Forest and Crooked River National Grassland: representing habitat, habitat requirements, occurrence within the project area, and consideration of potential for impact.

MIS Species	Representing Habitat, Habitat Requirements, Species Occurrence in the Project Area and Consideration of Potential Impact for Further Analysis
primary cavity excavators	*Representing:* snag habitat
	Habitat Requirements: snag habitat
	Considered. Snag habitat is present within the project area, as are primary cavity excavators. Direct removal of snags within units is not proposed under any alternative except where they pose a hazard. However, a small number of snags may be impacted indirectly by, or as a by-product of, proposed activities.
pileated woodpecker *Dryocopus pileatus*	*Representing:* old growth habitat
	Habitat Requirements: closed canopy, late-seral subalpine, montane, and lower montane forests
	Considered. Designated Old Growth Management Areas and habitat with old growth characteristics are present within the project area. Proposed actions would impact components of these habitat types and therefore may impact this species.
Rocky Mountain elk *Cervus elaphus* and **mule deer** *Odocoileus hemionus*	*Representing:* big game habitat
	Habitat Requirements: habitat generalist – mixture of successional stages in both forest and grasslands
	Considered. Big game species such as elk and deer and their habitats are present within the analysis area. Proposed actions would impact components of these habitat types and therefore may impact these species or their use of the habitat.

*Aren't American marten also Management Indicator species on the Ochoco National Forest? Loss of large trees, forest cover, and abundant downwood, as well as large snags with Pileated nest holes for denning would affect marten, who are already listed as "Vulnerable" in Oregon. Why are effects to marten not analyzed?

golden eagle *Aquila chrysaetos* and **prairie falcon** *Falco mexicanus*	*Representing:* cliff, talus, or cave habitats
	Habitat Requirements: nesting habitat includes ledges along rims and cliffs
	Considered. Cliff, talus, or cave habitat is present within the analysis area, though only in small amounts along the North Fork Crooked River Scenic Corridor. Treatment of cliff, talus, or cave habitats is not part of the purpose and need of this project, nor is it identified as a proposed activity in any alternative. No measurable impacts are anticipated to cliff or rock habitats as a result of implementing any proposed alternative. Identified Resource Protection Measures will mitigate potential adverse impacts to nesting raptors and their habitats. *Forest Plan Consistency*: Because this project impacts no cliff, talus, or cave habitats across the Forest, the overall effects would result in no change to the amount, nor condition, of the existing habitat, and thus is insignificant at the scale of the Forest. The North Fork Crooked River project is consistent with the Forest Plan, and thus continued viability of the golden eagle and prairie falcon is expected on the Ochoco National Forest.
bald eagle *Haliaeetus leucocephalus*	*Representing:* State or Federal Threatened or Endangered Species
	Habitat Requirements: associated with large bodies of water and nests in forested areas near water
	Considered, but not carried forward. See analysis in "Threatened, Endangered, Proposed, and Sensitive Species."

* The existing condition of snags for Primary Cavity Excavators concerns us regarding repeating → management (timber sale) proposed mistakes that will cause even

Existing Condition – Primary Cavity Excavators

The following quoted sections of the EA ("quotes from text") support our concerns: See EA pp. 60-61 under "Existing Condition- Primary Cavity Excavators".

Primary cavity excavators were selected to serve as an indicator for species that are dependent upon standing and down dead wood for nesting, roosting, and foraging. By providing adequate dead wood habitat for these birds, it is assumed that adequate habitat would be provided for other species that rely on dead wood for all or part of their life histories. Because these MIS were selected to represent dead and defective wood habitat, this analysis and discussion focuses primarily on that habitat component. greater deficits in snag abundance & large snags.

1) * "In general, populations of cavity nesting birds have declined across the Blue Mountains compared to historical conditions, primarily due to reductions in the numbers of large snags (Wisdom et al. 2000)." However, of the cavity-excavating MIS, Breeding Bird Surveys in Oregon have only detected a statistically significant decrease in populations of the northern flicker between 1966 and 2010 (Sauer et al. 2011).

2) * "Forest-wide snag analyses indicate that in both the Ponderosa Pine/Douglas Fir (PPDF) habitat type and the Eastside Mixed Conifer (EMC) habitat type there is currently more area with low levels of snags than would have occurred historically. Due to fire suppression many stands have skipped one or more fire return cycles, resulting in increased stand densities that resulted in tree mortality, and as a result, the area of Forest that contains 1–12 snags/acre >10" DBH is above HRV. Within the PPDF habitat type snag densities are above HRV for all other size classes across the Forest."

3) * "Within the EMC habitat type forest-level analysis shows that the area of forest that contains high densities of snags (12–36+ snags/acre >10" DBH) is below HRV, as well as areas with 10–18+ snags/acre >20" DBH. This is also at least to some extent the result of fire suppression which has limited high-intensity fire and thus the production of high-density snag patches."

Past timber harvest, thinning, road construction, presence of extensive road networks, firewood cutting, fire suppression, wildfires, prescribed fire, and grazing have combined to create the existing condition within the North Fork Crooked River project area. Existing distribution of snags and down wood within the project area

1) ✱ The EA analysis makes it clear that the North Fork Crooked River sale area is already not meeting snag abundance and size requirements based on comparison with historic (or never logged) snag levels and sizes. This

4) results from so many mature and large trees ✱ " being logged in the past, yet this sale

reflects the effects of past management activities as well as large-scale disturbance events. Past timber harvest targeted and removed many of the largest diameter trees reducing LOS stands. Large green replacement trees removed during this time reduced future snag potential and subsequent large snag densities throughout the project area." would repeat logging of mature trees although they are few and also widely spa

The Ponderosa Pine/Douglas-fir (PPDF) and Eastside Mixed Conifer (EMC) Wildlife Habitat Types (WHT) occur in the analysis area. A project specific snag distribution analysis using DecAID was completed for the existing condition and all alternatives and is incorporated here by reference. In addition, a distribution analysis was done for down wood within both wildlife habitat types. Below is a summary of the findings, see the Wildlife Appendix B in the project record for more details. This wa

Ponderosa Pine/ Douglas-fir Wildlife Habitat Type further reduce available large snags and abundant snags per acre to the detriment of wildl

In the PPDF WHT, the analysis area is above reference conditions for snags ≥20" DBH in snag density classes from 0–6 snags/acre and below reference conditions in classes with >6 snags/acre (Wildlife Appendix B, Figure B-1 in the project record). Historically 83% of the PPDF portion of the analysis area would have included <2 snags/acre of this size class. However, currently more of the area (87%) has <2 snags/acre than what occurred historically. And although the density classes with 6–18+ snags/acre historically occupied only 9% of the landscape, currently only 1% of PPDF in the analysis area includes >6 snags/acre. Distribution of snags >10" DBH in the PPDF WHT is similar to the distribution of large snags. There is currently more area with <12 small snags/acre than what occurred historically and all higher density classes are below historical conditions." species depend on larg snags, large lo abunda snags, a abunda logs.

(cont.2) ✱ already evident as a trend. See EA p.61, par.4

✱ 2) Although larger & abundant log reduction follows snag reduction, it is ✱ "Percent cover of down wood with diameter ≥20" in the analysis area is above reference conditions for areas with 0–1% cover and below reference conditions for areas with ≥1% cover (Wildlife Appendix B, Figure B-3 in the project record). Down wood ≥5" is above reference conditions for areas with 0–4% cover and below reference conditions for areas with ≥4% cover. While both size classes are lacking in the highest cover classes, which account for only a small percent of cover in reference conditions, overall distribution of both small and large down wood is relatively similar between reference conditions and current conditions. Such reductio of large snags and abundan

✱ "Currently the PPDF WHT within the analysis area is providing for less diverse snag and down wood habitat conditions than what was available historically within this habitat type." Additionally, there are approximately 6 trees/acre >20" DBH in the PPDF WHT which are considered green tree replacements for future snag recruitment.

✱ The Forest Service needs to stop commercial logging. About a century of logging plus over-grazing by livestock can no longer be sustained and still have biodiversity and a livable planet.

snags, as well as future large and abundant down wood, would violate Forest Plan requirem for snags and logs

Eastside Mixed Conifer Wildlife Habitat Type

In the EMC WHT, the analysis area is above reference conditions for snags >20" DBH in the 0–2 snags/acre category (Wildlife Appendix B, Figure B-2 in the project record). Historically 56% of the EMC portion of the analysis area would have included <2 snags/acre of this size class. However, currently more of the area (88%) has <2 snags/acre than what occurred historically. The EMC portion of the analysis area is below reference conditions for all snag density classes with >2 snags/acre, meaning there are fewer acres with high densities of snags than would have been present historically."

In the EMC WHT, the analysis area is above reference conditions for densities of snags >10" DBH in the 0–6 snags/acre category. All the categories with >6 snags/acre are below historical conditions (Wildlife Appendix B, Figure B-2 in the project record). This pattern is similar to conditions for densities of large snags.

Distribution of snag densities across the Ochoco National Forest in the EMC WHT is similar to this analysis area. "Based on research by Bull et al. (2007) and Ohmann and Waddell (2002) pileated woodpeckers and Williamson's sapsuckers may be limited to more productive sites in this WHT where snag densities are expected to be higher." ✱ We saw very little foraging sign by Pileated woodpecker and Williams Sapsucke in the sal units. See our survey sheets, with little wildlife sign.

Percent cover of down wood with diameter ≥20" in the analysis area is above reference conditions for areas with 0–1% cover and below reference conditions for areas with ≥1% cover (Wildlife Appendix B, Figure B-3 in the project record). Down wood ≥5" is above reference conditions for areas with 0–4% cover and below reference conditions for areas with ≥4% cover. Currently there is more area with only 0–1% down wood

✱ Based on the EA analysis, pp. 61→62, last par p.61 through the first two par.s of p. 62, the existing condition also violates Forest Plan standards for down wood and is below historic levels for large logs and abundant logs, needed by many wildlife species for habitat.

(*) Logging more mature trees would further reduce future log abundance and large logs below historic conditions, violating the Forest Plan.

cover in both diameter classes than existed historically. Current down wood conditions within the analysis area are adequate for pileated woodpecker at all tolerance levels, at the 30% tolerance level for black backed woodpecker, and just below adequate at the 30% level three-toed woodpecker.

2) (*) "Currently the EMC WHT within the analysis area is providing for less diverse snag and down wood habitat conditions than what was available historically within this habitat type. Currently, there are approximately 10 trees/acre >20" DBH in the EMC WHT which are considered green tree replacements for future snag recruitment. (*) There is no clear requirement under alt.s 2&3 to retain 10 trees per acre as green tree replacements for future snag recruitment that are

Environmental Consequences – Primary Cavity Excavators

Alternative 1

Under the no action alternative, no management activities are proposed. Distribution and abundance of snags would continue to change naturally due to endemic levels of insects, disease, stress mortality, and decay. Due to the increased number of dense stands in the project area, wildfire risk is also increased which, should a wildfire occur, could lead to higher densities of snags than with active management. Alternative 1 has the greatest potential for the development of high-density snag patches. big enough to become snags soon,

Disturbances due to wildfire or insects could have beneficial or adverse effects for standing and down dead wood habitat depending on the plant community affected and the severity or extent of such events. Smaller scale disturbances similar to historic fire events or insect outbreaks would benefit most primary cavity nesters that are dependent on snags and down wood. Large scale events outside of the historic range of variability would benefit some species in the short- to mid-term, but the overall gap in snag recruitment or large down wood over extensive areas could be detrimental to other species in the long term since replacement trees that ultimately provide future snags could take decades to develop.

(*) The omission of common natural disturbances from the "Forest Vegetation Simulator" makes future projections completely unreliable.

Table 26 lists estimates of snags per acre by wildlife habitat type. Estimates were derived from simulated treatments to representative stands using FVS modeling out to year 2052. These estimates are derived from modeling simulations using the Forest Vegetation Simulator (FVS), a system of highly integrated analytical tools that are based on a body of scientific knowledge developed from decades of natural resources research and experience. Simulations used for this analysis take into account recruitment of snags from density-related mortality and snag fall-down over time. Snag recruitment from stand disturbances due to insects, disease, or wildfire are not included in these estimates.

Table 26: Estimates of snags per acre in 2052 by alternative in both the PPDF and EMC wildlife habitat types for small (10–19" DBH) and large (>20" DBH) snags. (*) The Forest Service simply can't estimate the future snag numbers per acre, given the impossibility of predicting the effects of natural disturbances, in estimating snag numbers about 30 years into the future especially when there will be unpredictable extreme climate change effects. Such 30 year projections are also misleading because the next timber sale could be implemented soon after 30 years into the future, as that is the current short timber sale rotation time.

Habitat Type	PPDF 10–19" DBH	PPDF >20" DBH	EMC 10–19" DBH	EMC >20" DBH
Alternative 1	3.26	0.99	2.81	1.08
Alternative 2	2.21	1.08	0.06	1.01
Alternative 3	2.21	1.08	0.42	1.00

Alternative 1 would not directly affect standing and down dead wood habitat and therefore would not contribute to a negative trend in viability on the Ochoco National Forest for primary cavity excavators. In addition, modeling estimates indicate that Alternative 1 in both wildlife habitat types would provide higher densities of small-diameter snags in the future (≤30 years) and comparable densities of large-diameter snags (Table 26).

Alternatives 2 and 3

Direct removal of snags is not part of the purpose and need for this project, nor is it identified as a proposed activity in any alternative, except where hazards are identified, particularly along haul routes. Prescribed fire

1) (*) Resource protection measures and project design criteria will not fully "mitigate potential adverse impacts to primary cavity excavators and their habitats" as claimed on p. 63 par. 1, because these won't prevent the loss of future snags and down wood from mature trees being removed by logging under both action alternatives

has the potential to modify the current abundance of snags in treated areas through both reduction and creation as a result of implementation. A small amount of dead wood may be adversely impacted during thinning or prescribed fire operations. However, no measurable impacts are anticipated to current snag densities as a result of implementing any proposed alternative. Resource Protection Measures and project design will mitigate potential adverse impacts to primary cavity excavators and their habitats. Future snag recruitment may be diminished to some degree in areas where proposed treatments to reduce competition occur, however retained trees will grow larger over time and thus are more likely to provide larger snags in the future (Table 26).

2) (*) The number of woodpeckers seen and the amount of their foraging observed was conspicuously low compared to other sales we have field surveyed, indicating that PCE populations have already likely declined in the sale area due to high grading and clearcutting with conversion of mature forest to young plantations.

Cumulative Effects

Cumulative effects for these species were assessed using the analysis area described in the snag and down wood distribution analysis (Wildlife Appendix B in the project record), which included two watersheds that overlapped the project area and one adjacent watershed outside the project boundary (Wildlife Appendix A, Figure A-2 in the project record). All the past, present, and reasonably foreseeable future actions listed in Wildlife Appendix A, Table A-1 (in the project record) were considered for cumulative effects to primary cavity excavators and their habitat.

(*) 3) For wildlife species that are far-ranging, it is not sufficient to only consider effects that directly occur within the proposed project area (NFCR). Woodpeckers can be far ranging, as well as martens who use large snags with Pileated nestholes for denning.

The only project that may have affected snags in the analysis area since 2017 when the data for the distribution analysis was collected is the 2014 Wolf Fuels and Vegetation Management EIS, which included approximately 4,700 acres of commercial thinning, 988 acres of noncommercial thinning, and 5,000 acres of prescribed burning. Treatments associated with the Wolf EIS are currently in the implementation phase and all actions occur outside the North Fork Crooked River project area. The purpose and need for the Wolf EIS was similar to the North Fork Crooked River project and included similar Resource Protection Measures, including those for snag and down wood retention. As a result, snag loss on acres treated in the Wolf EIS was likely negligible, as was reduction of snags as the result of occasional hazard tree removal during treatment. The Wolf EIS included some removal of trees >21" DBH while remaining within HRV and providing green tree replacements to ensure future snag recruitment, similar to large grand fir removal in North Fork Crooked River. Both of these projects intend to reduce overstocked forested stands within dry forest types to restore stands to historic conditions as well as promote a more fire-tolerant landscape.

Current actions that were considered as having potentially negative effects on snag numbers within the project area were roadside salvage of hazard trees along major forest roads and public firewood collection. Legal personal-use firewood harvest would not have negative effects on dead wood levels in the project area since laws and standards for legal harvest were incorporated in the design of the DecAID distribution analysis. Some illegal firewood cutting likely occurs, but not in sufficient quantities to affect overall habitat suitability for primary cavity excavators. The Travel Management EIS (2011), Rager Cooperative Travel Management Area (TMA), and South Boundary Cooperative Travel Management Area all preclude off-highway vehicles from travelling cross-country within the project area. As a result, habitat conditions for nesting PCE's could benefit by limiting the disturbance and destruction of nests as well as further reducing access to illegal cutting of snags for firewood. Cumulatively, decreased open road densities would promote the longevity of snags within the project area.

(*) 4) Opening closed roads and building "temporary" roads in the NFCR sale would increase access for illegal snag logging for firewood, decreasing snag availability for PCEs further. Skid trails from logging are also used for illegal firewood cutting.

5) (*) What cumulative effects to snags are we not seeing that occurred before 2017? Why is that information only in the project record, rather than in the EA? Old growth or large snags can last much longer than 7-8 years.

When the past, current, and reasonably foreseeable actions are considered in combination with the action alternatives there is not expected to be a significant change in snag densities across the project area. The high-density snag categories within all available wildlife habitat types are currently below HRV. High-density snag categories are typically created from wildfires and are not expected to occur from the prescribed burning activities that are part of the proposed actions. Returning fire to the watershed has the potential to create small snag patches but is not expected to move overall snag densities in the high-density category towards HRV.

In the future, treated areas would have larger snags in lower densities while untreated areas would have smaller snags in higher densities. This complex distribution of dead wood habitat should provide for primary cavity excavators at the landscape scale, and proposed treatments should not move snag habitat away from HRV. Since only young trees are proposed for thinning, opportunities to provide snags in deficient areas and

7) (*) "young" trees in the analysis falsely characterize * cut. mature trees up to 21" dbh.

6) (*) These assumptions (with wavy underlining in the last two par.s of p. 63) are not supported by the analysis, which fails to consider the loss of future mature and large snags into the future from planned commercial logging of mature trees up to 21" dbh. The analysis also fails to consider the current conditions of below assumed HRV for large snags and higher densities of snags plus the effects of future snag loss from commercial logging.

sources for recruitment of future snags would be retained. For these reasons, this project is determined to be consistent with the LRMP as amended by the Regional Forester's Plan Amendment 2, and would not foreclose options to meet snag levels described in the VEMG in the long term.

Forest Plan Consistency

This project impacts little to no standing dead and/or down wood. Resource Protection Measures are in place to provide additional protections in those areas where dead wood may be impacted, including:

Retain all snags not considered a danger to operations. Snags that pose a safety hazard which cannot be mitigated would generally be felled and left onsite or utilized as large woody debris in adjacent stream and floodplain enhancement units, except where deemed inappropriate by the appropriate personnel.

Harvest activities would not remove existing down logs. Burn crews would be briefed to avoid direct ignition of large snags and down wood. Down logs are defined as logs that are ≥12" in diameter at the small end and >6 feet in length. Habitat would be provided similar to what was historically present and the minimum number of snags that need to be maintained through the life of the stand rotation would be retained." Thus, the North Fork Crooked River project is consistent with the Forest Plan as amended.

Conclusion

Because this project impacts little to no standing dead and/or down wood across the Forest, the overall effects would result in a small negative trend of habitat over the short-term. The loss of habitat would be insignificant at the scale of the Forest. The North Fork Crooked River project is consistent with the Forest Plan, and thus continued viability of primary cavity excavators is expected on the Ochoco National Forest.

Existing Condition – Pileated woodpecker (*Dryocopus pileatus*)

Habitat for pileated woodpeckers is increasing across the Blue Mountains due to an increase in dense, multi-canopy stands from fire suppression (Wisdom et al. 2000). However, densities of large-diameter snags (>20" DBH) have declined from historical to current levels due to the transition of stands to early seral forests that lack historical structure, which included large snags and large emergent trees that survived crown fires (Wisdom et al. 2000, Korol et al. 2002).

The Forest Plan allocated areas for old-growth management (MA-F6) to provide habitat for wildlife species dependent on old growth averaging 300 acres in size. The Forest Plan also stipulated that additional "supplemental feeding habitats" averaging 300 acres in size, now referred to as Pileated Feeding Habitats (PFH), would be located adjacent to old-growth management areas to meet the needs of old growth-associated wildlife species (USFS 1989b). These PFHs have since been identified and designated forest-wide.

In the Ochoco National Forest there are currently 14,510 acres of designated Old Growth Management Areas (OGMA) that are outside of wilderness and research natural areas, and another 16,620 acres of designated pileated feeding habitat in stands of mixed conifer and ponderosa pine. Some OGMAs may be functioning as habitat currently but are not likely to continue to serve as habitat because they are allocated on drier sites that likely cannot sustain the dense conditions required by pileated woodpeckers. A query of the forest database shows there are currently 63,478 acres of pileated habitat on the Ochoco National Forest which may occur within or outside of designated old growth management.

Within the North Fork Crooked River project area there are three OGMAs and portions of four PFHs (Table 27). Additional habitat outside of designated old growth is suitable for pileated woodpeckers, as identified by Viable modeling, bringing the total pileated habitat within the project area to 1,348 acres (Table 28).

64

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* In both alternatives 2 & 3, there would be logging of mature trees, not just "young" trees, when the trees are removed up to 21" dbh! Logging trees 15-21" dbh is removing the size class of trees next in line to become large, old, and become large snags.

* It's misleading to use the excuse that "the loss of habitat would be insignificant at the scale of the Forest" without disclosing and considering the effects of all the other timber sales' effects on snags and logs at the scale of the Forest, as the effects are cumulative to the viability of wildlife species, including Primary Cavity Excavators.

2) * All timber sales and "fuel" reduction involves reducing snag and down wood abundance.

3) * This is a very disingenuous claim that: "Habitat would be provided similar to what was historically present and the minimum number of snags that need to be maintained through the life of the stand rotation would be retained." when the previous sales already reduced the abundance and size of snags and down wood below the historic condition. This does not account for the loss of future snags and logs through logging removal of mature trees.

4) * It's misleading to use the excuse that "the loss of habitat would be insignificant at the scale of the Forest" without disclosing and considering the effects of all the other timber sales' effects on snags and logs at the scale of the Forest, as the effects are cumulative to the viability of wildlife species, including Primary Cavity Excavators.

5) * This is outdated – Pileated woodpeckers may now be declining due to logging of suitable Pileated habitat.

6) * We agree with the declining density of large snags being a reality, as in Wisdom et al. 2000 & Korol et al. 2002

7) * The EA analysis fails to disclose the science by Evelyn Bull that shows that 300 acre dedicated Old Growth areas & supplemental Pileated Foraging areas of 300 acres (which are not always suitable) are not enough to support Pileated pairs

* It's not sufficient just to state that the NFCR sale is consistent with the Forest Plan, and thus continued viability of primary cavity excavators is expected on the Ochoco National Forest." (EA p. 64) There is no analysis that really supports these conclusions: 1) that the NFCR sale is consistent with the Forest Plan, and 2) that consistency with the Forest Plan really ensures continued viability of Primary Cavity Excavators. That has not been the case, since many wildlife species are in decline after similar timber sales.

Table 27: Old growth management areas and associated pileated feeding habitat within the North Fork Crooked River project area.

Old Growth Management Area	D1-01 PFH	D1-03 OGMA	D1-03 PFH	D2-01 OGMA	D2-01 PFH	D1-11 OGMA	D1-11 PFH
Acres Total	351	259	509	430	430	517	438
Acres within the Project Area	53	259	509	385	430	225	102

Table 28: Pileated woodpecker habitat (acres) with relation to HRV by alternative.

Alternative	HRV - Min	HRV - Max	Acres (Post-Treatment)[1]	Relation to HRV
Alternative 1	419	860	1,348[2]	above
Alternative 2	419	860	810	within
Alternative 3	419	860	851	within

1: Acre totals do not consider effects to suitability of habitat from treatments other than commercial harvest.
2: Existing acres of habitat.

Densities of large-diameter snags (>20" DBH) that provide habitat for pileated woodpeckers at the 50% tolerance level are below reference conditions in both the Eastside Mixed Conifer and Ponderosa Pine/ Douglas-Fir Wildlife Habitat Types (Wildlife Appendix B in the project record). See "Primary Cavity Excavators" for a distribution analysis of snags and down wood in the project area. For pileated woodpeckers the analysis area is providing large snag habitat at the 30% tolerance level across approximately 7% of the area, providing habitat at the 50% tolerance level across 2% of the area, and providing habitat at the 80% tolerance level across 1% of the area (Wildlife Appendix B in the project record). Small snag habitat is present on 6%, 1%, and <1% of the area at the 30%, 50%, and 80% tolerance levels for pileated woodpeckers, respectively.

Current levels of down wood are above reference conditions at the 50% tolerance level in both Wildlife Habitat Types, although they are below reference conditions at the 80% tolerance level.

Environmental Consequences – Pileated woodpecker

Alternative 1

Under the no action alternative, no management activities are proposed; animals would not be displaced, harassed, or injured by the project. Habitat would remain as described in the existing condition section, with acres of available habitat currently above HRV. Due to an increase in dense, multi-canopy stands resulting from fire suppression, habitat for pileated woodpeckers is increasing across the Blue Mountains (Wisdom et al. 2000). However, densities of large-diameter snags (>20" DBH) have declined from historical to current levels (Wisdom et al. 2000, Korol et al. 2002). These trends would continue into the future under the no action alternative.

With the no action alternative there is an elevated risk of insect activity, disease, and high-severity wildfire as dense forest conditions would remain within the project area. Mortality to large pine from insect activity could result in snags for pileated woodpecker nesting habitat. However, depending on extent and severity, insect activity, disease, and/or wildfire effects would possibly set back the structural stage development, resulting in areas of young trees and longer time spans to develop old forest structures. Smaller fires of lower intensity could create snag habitat for pileated woodpeckers. In contrast, larger, more intense fire events would reduce pileated woodpecker habitat.

In the PPDF Wildlife Habitat Type (WHT) the landscape is below historic conditions for snag densities of both large (>20" DBH) and small (>10" DBH) snags (Wildlife Appendix B, Figure B-1 in the project record). However, large-diameter snag habitat for pileated woodpeckers is rare in this WHT both currently and within historic reference conditions.

In the EMC WHT the percentage of the landscape with more than four large-diameter (>20" DBH) snags per acre is currently lower than historic conditions, varying by about 29% in total (Wildlife Appendix B, Figure B-2 in the project record). These snag density classes provide habitat near the 30% tolerance level for pileated woodpecker. Large-diameter snag habitat for pileated woodpecker may be limiting in this WHT and therefore woodpeckers may be limited to more productive sites where snag densities are expected to be higher (Bull et al. 2007, Ohmann and Waddell 2002).

Alternative 1 would not directly affect pileated woodpecker habitat and in the short- to mid-term would benefit pileated woodpeckers. The risk of high-severity wildfire is present currently and would increase as stand conditions become denser over time. If high-severity wildfire occurs it is likely that pileated habitat would be lost to some degree which could contribute to a negative trend in viability on the Ochoco National Forest for this species.

Alternatives 2 and 3

Effects to pileated woodpeckers and their habitat would be generally similar between alternatives 2 and 3, distinguishable only by marginal differences in thinning prescriptions within the same treatment footprint. Implementation of either action alternative would treat approximately 40% of the pileated woodpecker habitat currently present within the North Fork Crooked River project area using combinations of thinning and prescribed burning. Alternative 2 directly reduces the amount of available habitat by approximately 538 acres while alternative 3 directly reduces the available habitat by approximately 497 acres (Table 28). Although the amount of suitable pileated woodpecker habitat would be reduced in relation to the existing condition, habitat within the project area would remain above HRV following treatment under either alternative (Table 28).

The reduction of habitat would predominately come as a result of commercial and noncommercial thinning. In addition, prescribed burning may have varying effects on habitat suitability by reducing down wood that provides foraging substrate (Bull et al. 2005). Commercial treatments would reduce the suitability of these stands for nesting and foraging in the short-term due to reduced stand densities and complexity. Alternative 2 retains all large-diameter trees (>21" DBH) except grand fir in certain circumstances. Trees in this size-class are essential habitat components for nesting and foraging for pileated woodpeckers and therefore retaining them at an adequate density is critical within suitable pileated habitat. Over time, canopy closure is expected to recover to some extent as the retained trees expand their crowns in diameter and depth in response to the release from competition that results from thinning. Noncommercial thinning would help promote the development of larger trees in the stand by reducing competition factors and could facilitate the development of higher-quality foraging and nesting habitat in the mid-term. Noncommercial thinning that occurs in grand fir and Douglas-fir PAGs is not expected to affect habitat in the short term because trees <9" DBH are not commonly used for foraging or nesting. In the mid- to long-term, habitat in these PAGs may be slightly reduced because thinning would select against grand fir which is a desirable forage species. In accordance with the Forest Plan, no thinning (commercial or noncommercial) or prescribed burning would occur within OGMAs or PFHs under any alternative.

"Prescribed burning would reduce habitat suitability by reducing down wood and canopy closure, and by altering the timing of mortality in grand fir and Douglas-fir stands." Fire is likely to result in an abundance of small-diameter (<10" DBH) fire-killed fir trees soon after the treatment, providing a flush of foraging substrate in the short-term, but later within-stand mortality would be expected to decline and thus foraging opportunities would decline as well from the lack of continued recruitment of snags. The level of impact to suitability for pileated woodpeckers with this treatment is dependent on fuel loading and burn conditions initially, as well as the frequency of maintenance burning, however prescribed burning has an associated prescription designed for each forested stand and that prescription would be designed to meet the purpose

⊛ It seems unlikely that large diameter snag habitat in the Ponderosa pine/Douglas-fir habitat historically. Why would that be? I've seen plenty of large snags in that habitat type where it wasn't high-graded or clearcut.

⊛ (Quotation marks in the text shows agreement with our comments.)

⊛ (Wavy lines indicate disagreement in the text.)

⊛ This is an example of why we find there to be an inadequate range of alternatives, since alt.s 2+3 are so similar: quote 2

⊛ only use noncommercial thinning up to 9" dbh in suitable Pileated woodpecker and marten habitat. Logging suitable Pileated habitat would likely render it unsuitable. Prescribed burning could remove large snag and log structure important to foraging for both species, along with reducing potential large snags for P. leated nesting and marten denning.

⊛ (Underlined text shows support for our concerns.)

→ would be especially harmful to Pileated woodpeckers for foraging.

⊛ Removing large Grand fir 21-30" dbh

⊛ Grand fir is strongly selected by Pileated woodpecker & Black bear for foraging - especially in large snags & logs. Pileated also sometimes nest in old growth large Grand fir.

⊛ Don't select against Grand fir in natural/historic mixed conifer that has the characteristics of typical Grand fir suitable sites. These include higher elevation, proximity to riparian areas, ash soils, and evidence of historic Grand fir - old growth Grand fir live, snags, logs, & stumps.

* Underlined text and text within our quotation marks indicate analysis supporting our concerns expressed in our Comments and our

 recommendations

3) (*) See our survey sheets and photos to identify Ponderosa pine LOS, and mixed

and need of the project. "As fire is not a precision tool, there is a chance that denser habitats suitable for nesting would be converted to a more open habitat through the loss of overstory or mid-story vegetation. This would likely be isolated to a low percentage of the overall treatment area, however this conversion would adversely impact nesting habitat conditions for pileated woodpeckers." conifer with sufficient old growth (or LOS) structure

(*) "Except for meeting the 30% tolerance level in the PPDF WHT, snag habitat at all pileated woodpecker tolerance levels and wildlife habitat types is currently below reference conditions in the North Fork Crooked River project area (see Wildlife Appendix B in the project record). Under both action alternatives, future densities of snags would be comparable to existing conditions for snags >20" DBH and below existing conditions for snags >10" DBH (Table 26)." In the short-term this project would maintain current levels of snag habitat as snags would not be felled under any alternative, outside of those deemed hazardous to operations. & sufficient canopy closure. The have the high old growth co

11) (*) Drop all commercial logging and prescribed burning in suitable Pileated woodpecker habitat.

"Treatments proposed in alternatives 2 and 3 would adversely impact nesting and foraging habitat for this species through a reduction in habitat abundance in the short- to mid-term. However, pileated woodpecker reproductive habitat would remain within HRV post-implementation (Table 28).

Cumulative Effects There are sale units planned for commercial logging & burning that are suitable Pileated woodpecker habitat. These include mixed conifer with old growth structure and Ponderosa pine LOS;

Cumulative effects for this species were assessed using the analysis area described in the snag and down wood distribution analysis (Wildlife Appendix B in the project record), which included two watersheds that overlapped the project area and one adjacent watershed outside the project boundary (Wildlife Appendix A, Figure A-2 in the project record). All the past, present, and reasonably foreseeable future actions listed in Table A-1 (Wildlife Appendix A in the project record) were considered for cumulative effects to pileated woodpeckers and their habitat. (*) Please note that currently there is only enough suitable Pileated habitat throughout the NFCR project area to support only one pair of Pileated woodpeckers as a home range. This means that continued logging of suitable Pileated habitat would reduce suitable habitat to the point where the single pair of Pileated woodpeckers would not survive. The Commercial logging & burning of suitable

21

(*) "There have been numerous timber sales within the project area over the long-term which included a variety of harvest prescriptions. Harvest prior to 1995 focused primarily on larger, high-value trees which would have otherwise provided high-value pileated nesting and roost trees." These past activities and events affected the amount of habitat on the landscape and are reflected in the Viable and Wildhab analysis of the existing condition.

The only other project within the cumulative effects boundary with treatments currently in the implementation phase is the 2014 Wolf Fuels and Vegetation Management EIS, of which all actions occur outside the North Fork Crooked River project area. The Wolf EIS included some removal of trees >21" DBH while remaining within HRV and providing green tree replacements to ensure future snag recruitment, similar to large grand fir removal in North Fork Crooked River. Both these projects intend to reduce overstocked forested stands within dry forest types in an effort to restore stands to historic conditions as well as promote a more fire-tolerant landscape.

(*) "These foreseeable treatments are likely to overlap with pileated woodpecker habitat to some degree as they would likely target dense stands containing grand fir and Douglas-fir. Although these actions would reduce habitat for the pileated woodpecker," the habitats designated by the Forest Plan for this species (i.e., OGMA and PFH) would be deferred from vegetative treatments and remain in their current abundance and distribution into the foreseeable future. "Suitable habitat outside of these designated habitats has the potential to be reduced," though habitat for this species would remain above HRV in both the North Fork Crooked River and Wolf EIS project areas, respectively.

The purpose and need for the Wolf EIS was similar to the North Fork Crooked River project and included similar Resource Protection Measures, including those for snag and down wood retention. As a result, snag loss on acres treated in the Wolf EIS was likely negligible, as was reduction of snags as the result of hazard tree removal during treatment. Current actions that were considered as having potentially negative effects on snag numbers within the project area were roadside salvage of hazard trees along major forest roads and public firewood collection. Legal personal-use firewood harvest would not have negative effects on dead wood levels in the project area since laws and standards for legal harvest were incorporated in the design of the DecAID distribution analysis (Wildlife Appendix B in the project record). Some illegal firewood cutting likely occurs, but not in sufficient quantity to affect overall habitat suitability for pileated woodpeckers. The Travel Management EIS (2011), Rager Cooperative Travel Management Area (TMA), and South Boundary

Pileated woodpecker habitat in the NFCR project area would extirpate Pileated woodpecker viability. The Forest Service is obligated to ensure the viability of

in the sale area. Management Indicator species, including Pileated woodpecker.

Cooperative Travel Management Area all preclude off-highway vehicles from travelling cross-country within the project area. As a result, habitat conditions for nesting woodpeckers could benefit by limiting the disturbance and destruction of nests as well as further reducing access to illegal cutting of snags for firewood. Cumulatively, decreased open road densities would promote the longevity of snags within the project area.

Fuels treatments from the North Fork Crooked River project occur within pileated habitat and may influence the distribution of this species as certain areas may be avoided during implementation due to effects from smoke. These treatments, and those proposed in the Wolf EIS, would not be burned simultaneously or in a contiguous block, so refugia would exist across the project area where pileated woodpeckers would be expected to persist.

Together with other landscape objectives that limit or discourage large fires and insect outbreaks, this project would help protect existing old growth habitat from these disturbances. However, these same treatments would contribute to a negative trend in dead and defective wood habitat across the Forest. These treatments, added to the need for hazard tree falling along roads and trails either from new projects or existing projects, would alter or remove potential pileated woodpecker nesting, roosting, and foraging snags.*

1) *

Therefore, the combined effect of the proposed action alternatives from the North Fork Crooked River project with these current and reasonably foreseeable actions would be that the abundance and distribution of pileated woodpecker habitat would remain within HRV at the cumulative effects boundary scale.

Forest Plan Consistency

* It's very unlikely & implausible that commercial logging in currently suitable Pileated habitat - & prescribed burning - in proposed

The Forest Plan indicates that the allocated OGMAs are intended to provide reproductive habitat for pileated woodpeckers, and additionally PFHs for supplemental feeding areas. Wildlife and Fish standards and guidelines for MA-F6 indicate that vegetative management would not be allowed until further research is available on the needs of the dependent species. "In OGMAs prescribed fire is normally not to be applied unless it can be supported by research, directives, and desired future condition. Timber harvest is prohibited in OGMAs." (USDA, 1989b) logging sale units - would have any "long-term benefit" to Pileated woodpeckers.

2) * We support no logging or prescribed burning in OGMAs & PFHs. However OGMAs & PFHs are not large enough to support a Pileated pair home range with 1 OGMA & 1 PFH. PFHs are not always fully suitable reproductive source habitat - based on Evelyn Bull's studies.

In accordance with the Forest Plan, no alternative in the North Fork Crooked River project proposes vegetative management treatments within an OGMA or supplemental feeding habitat (PFH). No prescribed burning is proposed for OGMAs or PFHs within the project area, although these treatments would be in line with Forest Plan direction regarding managing fuels within this management area (4-58). In addition, all OGMAs and PFHs within the project area are sufficient in size and meet standards established in the Forest Plan.

3) * It seems very unlikely that Pileated suitable habitat would remain above or within the assumed HRV, when field evidence shows many old growth fir & pine stumps creating gaps in suitable old structure & canopy for Pileated woodpeckers in the existing small amount of suitable Pileated habitat outside of the OGMAs & PFHs - in sale units planned for commercial logging and burning. There used to be more, before past high grading and conversion of alder mixed conifer to young pine plantations - and more Pileated woodpeckers.

Conclusion

With implementation of the action alternatives, pileated woodpecker habitat would remain above or within HRV for the project area. A short- to mid-term adverse effect is anticipated from prescribed fire and thinning treatments, however a long-term benefit to the species habitat within the North Fork Crooked River project area may result from these actions. This project implements Forest Plan standards by ensuring Old Growth Management Areas and respective pileated woodpecker feeding habitats are sufficient in size, and because this project impacts less than 10% of suitable habitat across the Forest, the overall direct, indirect, and cumulative effects would result in a small negative trend of habitat. The loss of habitat would be insignificant at the scale of the Forest, and thus continued viability of the pileated woodpecker is expected on the Ochoco National Forest.

4) * These assumptions under "Conclusion" are not supported.

Existing Condition – Rocky Mountain Elk (*Cervus elaphus*) and Mule Deer (*Odocoileus hemionus*)

5) * Once again, the FS uses the fallacy of switching analysis scale * to the Forest level without considering cumulative impacts on the Forest level

Rocky Mountain elk and mule deer are species that are commonly hunted and were chosen as terrestrial MIS for populations of big game and their habitat (USFS 1989b). The Forest strives to provide forage, thermal cover, and security habitats (hiding cover) to maintain healthy populations of Rocky Mountain elk and mule

(*) Commercial logging in RHCAs would reduce security cover & suitability for calving and fawning sites.

The Forest Plan includes the following standards and guidelines specific to the protection of elk calving sites and elk during calving season:

- Protect the character of elk calving sites (Forest Plan 4-246)
- Minimize disturbance from human activity during calving season, May 15 – June 30 (Forest Plan 4-246)

Activities proposed in Alternatives 2 and 3 would protect and enhance the character of riparian areas where calving and fawning are likely to occur. Commercial thinning, noncommercial thinning, and prescribed fire would improve forage and browse conditions by reducing tree density and canopy cover which would provide more growing space, sunlight, water and nutrients for aspen, other hardwoods (e.g., willows, alder), riparian vegetation, forbs, shrubs, and grasses. Hardwood enhancement such as planting of hardwoods would occur in riparian areas where they are absent or sparse, further improving the character of riparian areas. Increased forage may increase reproductive success of calving elk throughout the project area and provide for more calving areas to choose from as a result of more consistent forage quantity and quality throughout the early spring and late summer. Due to the treatments, riparian areas within the project area would become more desirable for calving and fawning. In addition, the aforementioned increase in elk security habitat from changes to the existing road system would increase the amount of high-likelihood calving and fawning habitat that occurs in security habitat within the project area (+297 acres).

Additionally, Resource Protection Measures are included in project design and Riparian Habitat Conservation Area (RHCA) prescriptions to protect the character of riparian areas. These include no-treatment buffers of various widths adjacent to stream channels and equipment restrictions. RPMs are also included to minimize disturbance from human activity during calving season. Project activities within 0.25 miles of riparian areas and hardwood stands that have low potential for human-caused disturbance would be restricted during calving season (May 15 – June 30). Seasonal restrictions may be waived in a particular year, with approval of the District Ranger, if surveys determine that calving elk are not present. If calving elk are present, project activities would remain restricted until completion of calving season.

The Forest Plan includes the following standards and guidelines specific to the protection of wallows during the rutting season:

- Protect wallows during rutting season, September 1 – October 15 (Forest Plan 4-246)

Resource Protection Measures included in the North Fork Crooked River project provide protections to wallows during the rutting season. These include no-equipment buffers around all seeps, springs, bogs, and known wallows by at least 50 feet and up to 150 feet, to prevent physical alterations during implementation as well as seasonal restrictions on activities to minimize disturbance during critical time periods. Due to the network of roads and trails within the project area some seeps, springs, and bogs lie immediately adjacent to open motorized routes or non-motorized trails, and these areas are not likely to serve as high quality habitat due to higher levels of human disturbance. In addition, livestock grazing may be present within portions of the project during rutting season and may impact use of the project area by elk, thus reducing the utility of some wallows. Project activities within 0.25 miles of seeps, springs, bogs, or known wallows that have low potential for human-caused disturbance would be restricted during rutting season (September 1 – October 15). Seasonal restrictions may be waived in a particular year, with approval of the District Ranger, if surveys determine that wallows are inactive or elk are not present. If active wallows or wallowing is observed, project activities would remain restricted until completion of rutting season.

Alternative 3

Metrics used to evaluate elk and deer habitat such as HEI, security habitat, and core habitat are similar between alternatives 2 and 3. The only differences between Alternatives are slight variations in HEI values for General Forest and General Forest Winter Range (Table 29).

In general, effects to elk and deer under Alternative 3 would be similar to those described for Alternative 2 with a few specific differences. Alternative 3 proposes lower intensity of commercial treatments than

Alternative 2 while having similar amounts of all other treatments. These thinning treatments would likely provide less beneficial effects to foraging habitat for elk and deer and reduced forage to cover ratio than Alternative 2 but would increase both from the existing condition.

Cumulative Effects

The cumulative effects boundary includes portions of the 2 watersheds that fall within the North Fork Crooked River project boundary (Wildlife Appendix A, Figure A-1 in the project record). All the past, present, and reasonably foreseeable future actions in Wildlife Appendix A, Table A-1 (in the project record) were considered for their cumulative effects to Rocky Mountain elk and mule deer and their habitat.

Currently there are no other projects in the planning or implementation phase within the analysis boundary that include commercial thinning or vegetation management treatments. All previous treatments are included as part of the existing condition. Some physical road closures approved through past decisions have not occurred within the project area, and these closures will occur as part of the North Fork Crooked River project and will reduce motor vehicle disturbance to elk and deer within the project area.

Livestock grazing as authorized by the Big Summit, Deep Creek, Fox Canyon, Little Summit, North Fork, Roba, and Wolf Creek AMPs is ongoing within the cumulative effects boundary except for a few exclosures. Proposed activities such as adaptive management and pasture rotation would improve grazing management and conditions of the habitat, thus providing more forage both for livestock and other ungulates such as deer and elk. The effects of these actions would contribute positively, when combined with other actions as proposed by the North Fork Crooked River project.

Therefore, the combined effect of the proposed action alternatives from the North Fork Crooked River project, with these current and reasonably foreseeable actions would be that the abundance and distribution of forage, security habitat, core habitat, and parturition habitat for elk and deer would likely increase at the cumulative effects boundary scale, while hiding cover would likely decrease.

Forest Plan Consistency

Elk and mule deer populations within the Ochoco GMU are below the state Management Objectives, however a surplus remains across the Ochoco National Forest and exceeds Forest Plan objectives. Activities in the North Fork Crooked River project would protect and enhance the character of riparian areas where calving and fawning are likely to occur. Resource Protection Measures are in place to minimize disturbance to individuals and reduce impacts to calving/fawning and wallowing habitats. The North Fork Crooked River project would impact the Habitat Effectiveness Index by reducing cover and modifying open road densities. However, cover standards would remain above Forest Plan standards in each alternative (Table 29), road densities would fulfill Forest Plan standards in each alternative (Table 29), and the overall HEI values would exceed Forest Plan standards in each alternative (Table 29).

Conclusion

Alternative 1 would not adversely affect habitat of the Rocky Mountain elk or mule deer and therefore would not contribute to a negative trend in viability on the Ochoco National Forest.

The overall direct, indirect, and cumulative effects for the action alternatives would result in a positive trend for many habitat variables for elk and deer, though some adverse impacts would be expected to occur as well. Security habitat and core habitat would be expected to increase with the modifications to the existing road system, reducing disturbance over time. However, disturbance would be higher during implementation due in large part to a reduction in the overall cover under all action alternatives, including hiding cover. This reduction in cover is coupled with a beneficial impact to available forage, providing an expected improvement in calving and fawning habitat within the project area. The North Fork Crooked River project is consistent with the Forest Plan, and thus continued viability of Rocky Mountain elk and mule deer is expected on the Ochoco National Forest.

re: Table 33, p. 78

Species / Habitat	Management Direction, Species or Habitat Occurrence within the Project Area and Consideration of Potential for Impact.
species associated with various plant communities and successional stages	*Management Direction:* Diversity is to be provided by maintaining representative portions of all plant associations and having various successional stages represented in an area through time.
	Considered, but not carried forward. Species associated with the various plant communities and successional stages within the analysis area are analyzed throughout the document, whether as TES species, MIS, other species, or as birds of conservation concern.
species associated with springs, bogs and other unique habitat	*Management Direction:* Identify, evaluate, and give appropriate protection.
	Considered, but not carried forward. The North Fork Crooked River interdisciplinary team has identified and evaluated springs, bogs, and other unique habitats, designed the project to avoid or enhance these habitats, and incorporated various Resource Protection Measures in the event that additional habitats are found. Examples of these Resource Protection Measures include no treatment 0-5 feet from the wetted edge and no mechanized equipment 0-15 feet from the start of dry soils around the edge of the spring or bog. *Forest Plan Consistency:* In accordance with management direction from the Forest Plan this project has taken springs, bogs, and other unique habitat into consideration during project planning, and additionally utilized Resource Protection Measures to mitigate any potential for adverse impacts. The North Fork Crooked River project is in compliance with the Forest Plan related to identification, evaluation, and providing appropriate protections for species associated with springs, seeps, bogs, and other unique habitats.
Introduced species	*Management Direction:* Evaluate proposals for introduction of wildlife through the NEPA process
	Not considered. There are no proposals for introducing wildlife species in the North Fork Crooked River project.

Springs, bogs, & other unique habitat are supposed to have 100 ft. buffers with no logging/not just up to 15' from the start of dry soils. The 100' buffer under INFISH & PACFISH has not been replaced. This small buffer is a violation of INFISH. Who decided not to use the INFISH 100 foot buffer? INFISH is embedded in the Forest Plan, so this is a Forest Plan violation and not consistent with Forest Plan direction.

& heavy equipment use

Existing Condition – Raptor Habitat (including Hawks and Owls and Northern Goshawk)

Raptors are birds of prey, of which numerous species occur or have been observed throughout the project area. The Forest Plan, as amended, provides guidance for protection of nests, protection of habitat surrounding nests, and minimizing disturbance to nesting or roosting individuals.

A variety of raptors are known to occur within the area of influence of this project or have been documented within the North Fork Crooked River project area. Known nest sites within the project area include: 9 goshawk territories, 2 osprey nests, and 1 red-tailed hawk nest.

A variety of forest management activities have affected the distribution and amount of habitat available for a variety of raptor species as well as adversely affected habitat for prey species. Past harvest activities were focused on the removal of large-diameter trees which decreased habitat for those species dependent on large-diameter, open stand conditions as well as large-diameter multi-storied conditions. Many species of raptors nest in large trees; where these structures have been removed, potential nesting habitat has been eliminated. However, open areas do provide foraging opportunities for many species that forage over open ground, such as Northern harriers, red-tailed hawks, and kestrels, as well as flammulated, barn, great horned, and Northern pygmy owls (Marshall et al. 2003). Commercial thinning areas may provide nesting habitat for some species of hawks and owls, such as ferruginous hawks, kestrels, great-horned owls, and long-eared owls who are known to prefer relatively open forests (Marshall et al. 2003). However, thinned stands would likely be too open for other owls and the forest dwelling raptors such as goshawks (Reynolds et al. 1982).

1) ✱ We agree with first sentence in par. 1 of p. 79, as repeated heavy mature tree logging takes place, this dense small tree condition will be stimulated again.

✱ Compounding past mistakes. We disagree that the dominant size class is 9-21" dbh as most density is only up to 9" dbh with some plantations may be up to 12-14" dbh, but these are usually widely spaced-any mature or younger-mature trees. This is why we emphasize the need for non-commercial size thinning, but oppose commercial-size logging in this sale area.

Past harvest activities have also reduced the size and distribution of dead wood habitat throughout the project area, which has affected a large number of prey species dependent on this habitat. Past harvest activities have resulted in dense forested conditions, compared to historic conditions, dominated by trees in the 9–21" DBH size class. Current habitat conditions would seem to favor species like the Coopers hawk that prefers fairly closed stand conditions 50–70 years old (Reynolds et al. 1982). Past harvest activities, grazing activities, and fire suppression activities have resulted in much denser forest conditions that have expanded into areas once dominated by shrubs. Higher conifer densities have also resulted in the decline of understory shrub and grass species. A variety of prey species may have been affected by this change in vegetation conditions. Cattle grazing and grazing by wild ungulates removed herbaceous and shrubby vegetation which affected vegetation availability for cover, forage, and nesting habitat for a variety of bird and small mammal species.

The Eastside Screens (USFS 1995) established minimum standards for the protection of the northern goshawk, stating that "until further information is known, and management plans approved to ensure species viability, the following standards are to be met as a minimum."

2) ✱ Note that these are minimum protection for goshawks, not full protection. These minimum standards have not been updated. Only ensuring these minimum standards does not ensure goshawk viability.

The minimum standards which are still in effect are:

- Protect every known active and historically used goshawk nest site from disturbance. "Historical" refers to known nesting activity occurring at the site in the last 5 years. Seasonal restrictions on activities near nest sites would be required for activities that may disturb or harass a pair while bonding and nesting.
- 30 acres of the most suitable nesting habitat surrounding all active and historical active nest tree(s) would be deferred from harvest.
- A 400-acre "post fledging area" (PFA) would be established around every known active nest site. While harvest activities can occur within this area, retain LOS stands and enhance younger stands toward LOS condition, as possible.

3) ✱ We are opposed to commercial logging in the 400 acre post-fledging area, as the juvenile goshawks need forest cover protection to successfully learn to hunt in suitable goshawk habitat without competition from raptors and owls adapted to more open forest conditions.

There are 9 known nesting territories within the North Fork Crooked River project area (Table 34). A 400+ acre PFA and 30+ acre nest core has been mapped for each territory. For the purpose of this analysis all territories are considered occupied; however, some territories have no documented activity within the recent past. Surveys are ongoing within the project area to determine the continued viability of these territories in future projects.

Table 34: Status of northern goshawk nest and post-fledging areas within the North Fork Crooked River project area.

Territory	Last Year of Documented Activity	Post Fledging Area Size (acres)	Nest Stand Size (acres)
Berkley Spring	2021	437	32
Crossroads Reservoir	2022	420	35
Deep Creek	2003	435	31
Donnelly Creek	1995	436	35
Hewed Log Creek	2005	400	32
Long Ridge	1995	415	36
Paulina Butte	2002	402	32
Roba Creek	2020	428	36
Upper Dipping Vat Creek	2020	418	33

✱ We are strongly opposed to any commercial logging in Post-Fledging Areas for goshawks. The rapacious nature of current logging requires the protection of more suitable nesting and Post Fledging habitat as backup for existing nest areas or PFAs that are abandoned or rendered unsuitable by too much human disturbance, wild fire, or local drought. Extreme climate change effects are likely to force many wildlife species to seek more suitable habitat than what they have used recently or historically.

(*) The "Viable" model may be over-stating the acreage of suitable N. goshawk habitat available, as goshawks need at least 40% canopy closure for foraging and at least 60% canopy closure for nesting, along with sufficient large live trees, large snags, and abundant down wood for prey species.

Additional habitat outside of designated PFAs exists within the project area. Queries of forest habitat databases using Viable identified 10,618 acres of northern goshawk reproductive habitat within the project area, including those acres identified within PFAs. Historically, between 1,032 and 2,865 acres of reproductive habitat would have been present within the project area (Table 35). The amount of habitat present is currently above the Historic Range of Variability (HRV).

Table 35: Northern goshawk habitat (acres) with relation to HRV.

Alternative	HRV - Min	HRV - Max	Acres (Post Treatment)	HRV (Year 1)
Alternative 1[1]	1,032	2,865	10,618[1]	above
Alternative 2	1,032	2,865	7,321	above
Alternative 3	1,032	2,865	8,321	above

1: Existing condition.

Environmental Consequences – Raptor Habitat (including Hawks and Owls and Northern Goshawk)

Alternative 1

Alternative 1 would not treat forested stands within raptor habitat (e.g., habitat within currently mapped PFAs, or areas outside PFAs deemed suitable habitat for various raptor species) and thus current trends in forest development would continue to occur. This alternative would maintain the existing acres of fir-dominated understories and the trend toward fir-dominated habitats. This would tend to favor the forest dwelling raptors (i.e., Coopers hawk, sharp-shinned hawk, northern pygmy-owl, and northern saw-whet owl). These dense, fir-dominated understory conditions would result in a continued loss of herbaceous and shrubby vegetation in the understory. As a result, the ability of raptors that select for open-forest conditions to effectively hunt ground-dwelling small mammals would continue to be limited. There would be a continued decline in habitat for species that prefer open ponderosa pine habitats such as the flammulated owl, as stand densities would increase within these habitats. Lack of treatment of the mid-story trees where a larger overstory exists would lead to the development of multiple canopy layers with increased canopy closure, a condition preferred by goshawks for nesting.

This alternative would maintain the suitability of all existing habitat for raptors in the short term and would not result in disturbance or displacement of raptors from existing occupied territories.

In the long-term, large trees within existing stands would continue to be susceptible to mortality from competition with understory trees and an increased level of risk of loss due to insects and disease. While some stands may attain increased tree diameters naturally over time, the diameter growth of retained trees would not be as rapid as that of retained trees in treated stands (Mowat 1953, Barrett 1982, Ferguson et al. 2011). As these large-diameter trees die, fewer nest trees in general are available for raptors.

There is also an increased threat of high severity wildfires occurring as stand densities increase, ladder fuels increase, and ground fuels accumulate. Dense understories, which exist in many of the PFAs, as well as additional habitat outside of PFAs, may lead to increased susceptibility of stand-replacing fire and insect and disease outbreaks which can result in the deterioration or loss of habitat (Graham et al. 1999, Wisdom et al. 2000).

This alternative would result in short-term retention of the existing amount and distribution of northern goshawk habitat at the landscape scale; 10,618 acres of habitat in the project area. In the mid-term, an increase of goshawk habitat would occur as a result of more dense mature forest. These conditions would continue to benefit the goshawk until an event such as a high-severity wildfire or insect and disease outbreak occurs and renders the stand unsuitable.

1) ✱ We are opposed to widespread commercial-size logging under alts 2 & 3, and to large Grand fir logging under alt. 2 due to the lack of large tree structure compared to historic conditions and the extensive loss of 15-21" dbh mature live trees from past logging, leaving the scarce remaining 15-21" dbh mature trees to grow into future large trees to replace the deficit large structure over time. Yet commercial logging planned would likely remove many of the last mature trees, perpetuating the existing condition of mostly small trees filling in the gaps. This would effectively prevent LOS from increasing on a landscape scale, adversely affecting goshawks, Pileated woodpeckers, Northern Flickers, Great Gray owls, Lewis's woodpeckers, Williamson's Sapsuckers, martens, and any Pacific fishers (we saw a Pacific Fisher in the Ochoco Wolf sale - a positive daylight sighting.)

Alternative 2

Alternative 2 proposes a variety of treatments that may adversely impact habitat for some raptor species that prefer a more closed canopy structure, while benefiting other raptor species that prefer a more open midstory or understory. Commercial and non-commercial thinning treatments could reduce canopy closure below 60% in treated stands. However, retained trees would likely expand their crowns in diameter and depth in response to the release from competition. Thinning of mid-story trees would promote the development of large structure trees, large snags, and down logs. Reducing competition from below would likely improve the longevity of existing large trees in the overstory as well. While treatments may reduce suitability in the short- to mid-term for forest raptors and the small forest-dwelling owls, in the long-term treatments may maintain the overstory canopy by improving health and vigor of retained trees. The development of herbaceous and shrubby vegetation in the understory that results from reducing conifer density should improve habitat for shrub- and ground-nesting birds and also improve the ability of open-forest avian predators to effectively hunt small mammals. Large raptors that nest in large-diameter trees or snags using relatively open forests, such as red-tailed hawks and golden eagles, would benefit in the mid- to long-term from treatments that promote the development of large trees and snags.

Under certain conditions alternative 2 proposes to cut grand fir trees greater than 21" DBH, potentially up to 30" DBH. In the short- to mid-term, removal of trees >21" DBH would adversely affect raptor nesting habitat where these treatments overlap. In the long-term, retained trees would be expected to increase their growth rates from reduced competition, and over time could provide larger live trees and snags for nesting, roosting, and perching. However, because the health of the retained trees is also improved by thinning, there is a slight reduction in the overall number of snags into the future when compared to the existing condition (Table 26).

Prescribed burning may impact individuals in the short-term due to heat and smoke from underburning operations, depending on the intensity of the burn and weather conditions. Not all acres would be burned simultaneously, nor in a contiguous block, so refugia would exist across the project area where raptors would be expected to persist. While short-term impacts could occur, prescribed burning that reduces fuels and future fire intensity would maintain nesting and roosting habitat on the Forest for raptors. As fire is not a precision tool, there is a chance that dense suitable nesting habitat would be converted to a more open habitat through the loss of overstory or mid-story vegetation. This scenario would likely be isolated to a low percentage of the overall treatment area. This conversion, depending on the size of the area, may be beneficial to raptors that prefer more open habitats. If too large or in the wrong place, however, this treatment may adversely impact raptors that select for dense habitat conditions.

Habitat for raptor prey species would be improved through a number of proposed activities. Prescribed burning may initially reduce the suitability of habitat for prey in the short-term through the loss of ground cover of forbs or down wood. However, in the mid-term prescribed fire may help to reinvigorate the growth of native forb and grass species and may improve conditions across the project area provided it is done in a mosaic pattern where unburned patches remain post-treatment.

Various treatments are proposed within goshawk PFAs across the project area (Table 36, Table 37). In accordance with the Forest Plan, treatments would have seasonal restrictions to minimize disturbance to nesting goshawks and would not occur within designated goshawk nest cores. Treatments within PFAs are designed to maintain the overstory in the short, mid-, and long-term, while also accelerating development of large-diameter trees in the mid- to long-term. These treatments may have light adverse impacts to suitable reproductive habitat (outside of nest cores) for goshawks in the short- to mid-term as the mid- and understory habitats are opened up. These treatments may also have a beneficial impact, as thinning and fuel reduction lower the risk of stand-replacing wildfire which could render the habitat unsuitable. Therefore, these treatments should allow this habitat to persist on the landscape into the future in a state which can be managed and maintained for the needs of the species.

2) ✱ We are strongly opposed to any commercial-size logging in goshawk Post-fledging Areas. Any Non-commercial thinning in goshawk PFAs should be lighter than NCTing elsewhere, as goshawk prefer dense habitat and there is not much mature tree density.

Table 36: Northern goshawk post fledging areas with associated proposed silvicultural treatments for Alternative 2 within the North Fork Crooked River project area.

Post Fledging Area	PFA Total Acres	Commercial Thinning[1] Acres	Non-Commercial Thinning[2] Acres	Treatment Total Acres
Berkley Spring	437	207	12	219 (50%)
Crossroads Reservoir	420	164	0	164 (39%)
Deep Creek	435	3	0	3 (1%)
Donnelly Creek	436	112	0	112 (26%)
Hewed Log Creek	400	50	40	90 (23%)
Long Ridge	415	74	77	151 (36%)
Paulina Butte	402	0	0	0 (0%)
Roba Creek	428	70	78	148 (35%)
Upper Dipping Vat Creek	418	166	45	211 (50%)

1: Includes subsequent non-commercial thinning and fuels treatment on those same acres.
2: Includes only those acres outside of commercial harvest units, but does include subsequent fuels treatment on those same acres.

Alternative 3

Effects to raptor habitat under alternative 3 would be similar to effects described for alternative 2, however specific differences do exist. Alternative 3 proposes the same noncommercial treatment footprint with 1,491 acres less commercial treatment than alternative 2. These thinning treatments would likely provide a milder adverse effect to nesting habitat for raptor species that prefer dense forest conditions than those in alternative 2. No trees >21" DBH would be cut. Fuels treatments from the North Fork Crooked River project may influence the distribution of these species as certain areas may be avoided during implementation due to effects from smoke. These treatments would not be burned simultaneously or in a contiguous block, so refugia would exist across the project area where raptors would be expected to persist.

Alternative 3 proposes the same noncommercial treatment footprint within goshawk PFAs as alternative 2, with the notable difference that nearly all commercial treatments (844 of 846 acres) in alternative 2 would be excluded in alternative 3 (Table 37). These treatments would open the forest mid- and understory through non-commercial thinning and prescribed fire, and therefor would adversely impact nesting habitat for this species in the short- to mid-term. However, goshawk reproductive habitat would remain above HRV post-implementation under this alternative (Table 35).

Table 37: Northern goshawk post fledging areas with associated proposed silvicultural treatments for Alternative 3 within the North Fork Crooked River project area.

Post Fledging Area	PFA Total Acres	Commercial Thinning[1] Acres	Non-Commercial Thinning[2]	Treatment Total Acres
Berkley Spring	437	0	219	219 (50%)
Crossroads Reservoir	420	0	164	164 (39%)
Deep Creek	435	2	1	3 (1%)
Donnelly Creek	436	0	112	112 (26%)
Hewed Log Creek	400	0	90	90 (23%)
Long Ridge	415	0	151	151 (36%)

Paulina Butte	402	0	0	0 (0%)
Roba Creek	428	0	148	148 (35%)
Upper Dipping Vat Creek	418	0	211	211 (50%)

1: Includes subsequent non-commercial thinning and fuels treatment on those same acres.
2: Includes only those acres outside of commercial harvest units, but does include subsequent fuels treatment on those same acres.

Cumulative Effects

The cumulative effects boundary includes portions of the 2 watersheds that fall within the North Fork Crooked River project boundary (Wildlife Appendix A, Figure A-1 in the project record). All the past, present, and reasonably foreseeable future actions in Wildlife Appendix A, Table A-1 (in the project record) were considered for their cumulative effects to the raptors and their habitat.

There have been numerous timber sales within the project area over the long-term which included a variety of harvest prescriptions. Harvest prior to 1995 focused primarily on larger, high-value trees which would otherwise have provided high-value nesting and roost trees for raptors. All previous treatments are included as part of the existing condition, and there are currently no other projects in the planning or implementation phase within the analysis boundary that include commercial thinning or vegetation management treatments. Proposed treatments associated with the North Fork Crooked River project intend to reduce overstocked forested stands within dry forest types to restore stands to historic conditions as well as promote a more fire-tolerant landscape. Together with other landscape objectives that limit or discourage large fires and insect outbreaks, the project would help protect existing large and/or dense tree habitat from these disturbances. However, these same treatments would contribute to a negative trend in dead and defective wood habitat across the Forest. These treatments, added to the needs for hazard tree falling along roads and trails either from new projects or ongoing/existing projects, would alter or remove potential raptor nesting and roosting habitat as well as habitat for raptor prey.

Therefore, the combined effect of the proposed action alternatives from the North Fork Crooked River project, with these current and reasonably foreseeable actions, would be that the abundance and distribution of habitat for raptors that select for dense forested habitats would be reduced at the cumulative effects boundary scale in the short- to mid-term, while those species that select for more open habitats would be increased.

Forest Plan Consistency

As identified in the Forest Plan Standards and Guidelines for hawk and owl nests, a primary buffer of five chains (330 feet) would be flagged around each nest site and a seasonal restriction on treatments (March 1 – August 1) within 10 chains (660 feet) of active hawk or owl nests would be implemented under all action alternatives. In accordance with direction from the Eastside Screens, post fledging areas (PFA) have been mapped for all known occupied goshawk territories in the project area. The 30-acre goshawk nest core areas would have no treatments under any action alternative. Harvest activities within PFAs would not remove LOS trees. Treatments within PFAs and/or within close proximity to known goshawk nests would be implemented with seasonal restrictions. These restrictions would be employed for disturbance activities within 0.5 miles of known goshawk nest sites, from March 1 – September 30.

Seasonal restrictions for raptors may be waived on a case-by-case basis, if appropriately-timed monitoring indicates that the raptor nest area is not reproductive during that nesting season. This assessment cannot be made until well into the nesting season. All action alternatives considered in the North Fork Crooked River project are consistent with the Forest Plan, as amended by the Eastside Screens.

Conclusion

1) (A) Due to the subterfuge of a "All previous treatments [i.e. management, including logging and road construction] are included as part of the existing condition," the cumulative effects analysis fails to disclose and consider the results from past timber sales to goshawk PFAs and other suitable habitat. Have the goshawk PFAs already been logged, NOted, or prescribed burned in past timber sales? What were the consequences to the existing N. goshawk nesting fidelity and success? Are there fewer N. goshawk pairs now than there were before past logging or other management of PFAs

2) (A) Keeping the scale of wildlife- and goshawk analysis to only the immediate project area is also problematic, as there is no indication of goshawk accurate population numbers, viable nests (being used), reproductive success, etc. to show if goshawks are in decline in the sale area, or if there is an overall decline across the National Forest or District.

were any of the 30 acre goshawk nest areas logged? Without such detailed, specific causes of harm analysis, there will likely be no adaptive management to better protect goshawk viability in the current or future proposed timber sale areas. Without such specific, detailed environmental effects analysis for goshawk populations, reproductive success, whether goshawk are declining, and the root causes, this EA cannot ensure the viability of N. goshawk in the project area if the PFAs are commercially logged, or if too much of the PFAs are NOted or burned.

(A) 3) If the information as to the population of N. goshawks on the Deschutes National Forest, and within the District and the project area was disclosed and evaluated, this would greatly inform decisions as to how much protection goshawks need. The EA should also be disclosing relevant science regarding habitat requirements for goshawks and any new science that explores better protection methods for goshawks.

⊛ There is no analysis in the EA that clearly indicates continued viability of goshawks in the NFCR area, the District, and the National Forest

Alternatives 2 and 3 would maintain the suitability of habitat for raptors that select for open forest environments within treated stands and for other species in untreated stands. Resource Protection Measures for raptors would be implemented under all action alternatives.

The North Fork Crooked River project would result in a negative trend of habitat for dense forest dwelling raptors (e.g., goshawks) and a positive trend for those species that prefer more open forest types for foraging. In addition, treatments would better reflect habitat that was present historically, and goshawk habitat post-implementation would remain above the historic range of variability. However, it should be noted that treatments that benefit one type of raptor may adversely affect another type of raptor. Regardless, all projects past and present incorporate the same Resource Protection Measures to protect active bird of prey nests from human disturbance and from adverse habitat modification. Continued viability of raptors, including the northern goshawk, on the Ochoco National Forest is expected with the implementation of any of the action alternatives.

Existing Condition – Pronghorn Antelope (*Antilocapra americana*)

Pronghorn antelope are established east of the Cascade Range in most of Oregon (Verts and Carraway 1998). They are usually associated with areas of open plains, but in Oregon their primary habitats are broad areas dominated by big sagebrush and intermittent lakes (Good 1977, Herrig 1974), and occasionally areas with widely spaced junipers or ponderosa pines (Mace 1954, Polenz 1976). In Oregon, availability of water is the predominant factor influencing seasonal site use within these habitats (Good 1977, Herrig 1974). Pronghorn consume a variety of forbs, grasses, and shrubs for nourishment. Their diet consists of mostly woody sagebrush in fall and winter, with a mixture of forbs in spring and summer.

On the Ochoco National Forest, pronghorn generally occur in low quantities and are most commonly observed in larger prairie habitats within close proximity to Big Summit Prairie. The Forest Plan does not identify a model for pronghorn habitat analysis, but does specify that habitat for pronghorn is to be managed in accordance with ODFW Management Objectives. However, ODFW doesn't develop pronghorn Management objectives similar to those of elk and mule deer. Instead, population trends are monitored and hunting seasons vary in response to those trends.

Environmental Consequences – Pronghorn Antelope

Alternative 1

None of the proposed actions would occur under this alternative. The existing condition as described for pronghorn antelope would be unchanged in the short-term and current trends in habitat condition would continue. Conifer expansion would continue to infringe on open habitat, decreasing the availability of shrubs, grasses, and forbs for forage as well as the open conditions that antelope utilize to evade predators.

Alternative 1 would have no direct effects on pronghorn antelope but could lead to reduced habitat suitability through conifer expansion, including conifer expansion into non-forested areas. This alternative would not directly affect antelope habitat and therefore would not contribute to a negative trend in viability on the Ochoco National Forest.

Alternatives 2 and 3

It is anticipated that effects to pronghorn antelope as a result of activities implemented with Alternative 2 and 3 would be similar to those summarized for Rocky Mountain elk and mule deer. Prescribed burning and thinning, both commercial and noncommercial, would likely improve habitat for antelope by maintaining open conditions and reinvigorating grass and forbs utilized as forage. Resource Protection Measures that provide protections to RHCAs and elk wallows would ensure continued access to water sources by antelope across the project area.

The effects of reducing road densities would also increase security habitat for antelope. The proposed changes to the existing road system within the project area would increase security habitat acres (+9,793 acres), proportion of the project area providing security habitat (+26%), and average security habitat block

1) ✱ Having field surveyed almost all of the commercial sale units, we don't see any ecologically legitimate need to do any commercial logging at all. Wildlife connectivity corridors are some of the most important wildlife habitat (along with LOS and RHCAs) to not commercially log. Non commercial thinning and prescribed burning would be sufficient to reduce or eliminate any excess density. Since the vast majority of trees are small (<9" dbh), just NCT'ing and prescribed burning could open up wildlife corridors too much.

Alternatives 2 and 3 propose the same treatment footprint within connective corridors, with alternative 3 proposing 241 acres less commercial treatment and various minor differences (Table 38). The commercial thinning proposed within both action alternatives would selectively thin stands to reduce density, thereby increasing tree growth and reducing susceptibility to insects, disease, and fire. Thinning would reduce densities to be within the management zone as determined by site productivity and tree size (Powell 1999). The management zone is the range of stand density between full utilization of the site resources (on the lower end) and the onset of competition-induced mortality (at the upper end). Alternatives 2 and 3 include portions of commercial thinning units within connective corridors encompassing approximately 931 and 690 acres, respectively. Prescriptions in the connective corridors would be modified to retain density in the upper half of the management zone (63% or more of site potential). This level of density, in addition to retained understory, would maintain canopy closure in the top one third of site potential and meet the Interim Wildlife Standard.

Commercial thinning followed by noncommercial thinning and fuels treatment would also maintain or enhance the development of large tree structure and would reduce the risk of unwanted loss due to wildfire, insects, and disease. Resource Protection Measures exist for commercial and noncommercial thinning treatments and would leave portions of units in un-thinned patches, except where desired conditions are in direct conflict. These Resource Protection Measures are designed to maintain the dense nature of the understory forest structure, which is a critical component for numerous LOS-dependent wildlife species.

Prescribed burning alone is not anticipated to meaningfully change canopy cover or affect corridor function. However, fire is not a precision tool, and as such there is a risk involved to this type of treatment within dense and multistoried habitats. Should areas burn hotter than anticipated, there is potential for loss of small, isolated pockets of canopy cover due to single tree torching or small stand mortality from fire effects.

Table 38: Acres of treatment by type in connectivity corridors by alternative.

Alternative	Commercial Thinning[1]	Non-Commercial Thinning[2]	Prescribed Burning[3]	Total area
Alternative 2	931	504	36	1,474
Alternative 3	690	751	34	1,474

1: Includes subsequent non-commercial thinning and fuels treatment on those same acres.
2: Includes only those acres outside of commercial harvest units, but does include subsequent fuels treatment on those same acres.
3: Includes only those acres outside of commercial and non-commercial units.

So groups of small NCT-size tree patches should still be retained - especially when there is little or no overstory or midstory large and mature trees.

✱ Drop all commercial logging in wildlife connectivity corridors - specifically the 931 acres under alt. 2 and the 690 acres under alt. 3. The small print footnotes #2+3 are concerning: Are the 931 or 690 acres in Table 38 the only acres that would be commercially logged or not? If there is additional acreage of commercial logging in wildlife connectivity corridors in other "commercial harvest units" or "commercial and non-commercial units" (footnotes 2&3, p. 87)? If so, we want any additional commercial logging in wildlife connectivity corridors dropped entirely, with more retention of NCT-size trees.

✱ Cumulative effects analysis should be at least summarized in the EA without omitting any critical or pertinent information. There is no cumulative effects analysis re: wildlife connectivity corridors in the EA except for foreseeable future actions. This violates the NEPA requirements for cumulative effects analysis.

Cumulative Effects

The cumulative effects boundary includes portions of the 2 watersheds that fall within the North Fork Crooked River project boundary (Wildlife Appendix A, Figure A-1 in the project record). There are no other proposed vegetative treatments within the project area which would affect upland vegetation within mapped connectivity corridors. All the past, present, and reasonably foreseeable future actions in Wildlife Appendix A, Table A-1 (in the project record) were considered when the corridors were delineated.

Forest Plan Consistency

Connectivity corridors were delineated for the North Fork Crooked River project based on specific direction from the Eastside Screens pertaining to the establishment and management of connectivity corridors including:

- LOS stands need to be connected with each other inside the watershed and to like stands in adjacent watersheds in a contiguous network pattern by at least two different directions.
- Corridors should commonly have medium-diameter or larger trees.
- Canopy closure would be maintained within the upper third of site potential.
- Corridors are at least 400 feet wide.

87 Footnote #2 for Table 36 on p. 82 re: goshawk PFA commercial logging also needs to be clarified re: any additional logging in PFAs.

- Length of corridors are as short as possible.

The North Fork Crooked River project is consistent with the Forest Plan as amended and should allow for the free movement between suitable breeding habitats for LOS-dependent species.

Conclusion

Connectivity corridors were delineated to connect LOS habitat within the project area and to LOS habitat outside the project area according to the Eastside Screens direction. Although canopy cover would be reduced for all action alternatives because of thinning activities, unit prescriptions would maintain canopy closure in the top one third of site potential and meet the Interim Wildlife Standard.

Birds of Conservation Concern

Migratory birds breed in the U.S. and winter south of the border in Central and South America. Continental and local declines in population trends for migratory and resident landbirds developed into an international concern and led to the creation of the North American Bird Conservation Initiative. Under this initiative, plans were developed for the conservation of waterbirds, shorebirds, seabirds, and landbirds. The landbird initiative known as Partners-In-Flight (PIF) has developed a series of bird conservation plans for every state.

The Oregon and Washington Chapter of PIF was formed in 1992 and has since developed a series of publications aimed at assisting private, state, tribal, and federal agencies in managing for landbird populations. In 2000, Oregon-Washington Partners in Flight published the Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington (Altman 2000). This strategy has since been updated (Altman and Bresson 2017) to address the requirements contained in Executive Order 13,186 (2001) as well as those agreed upon by the USFS and USFWS (USFS 2008, 2014, 2016) regarding responsibilities of federal agencies to protect migratory birds. Many of the birds identified in this plan are also addressed in the U.S. Fish and Wildlife Service's Birds of Conservation Concern (BCC; USFWS 2021). (*) Please send me a hard copy by mail of Altman and Bresson 2017 re: the updated Conservation Strategy for Landbirds or let me know how to obtain a copy.

Existing Condition - Birds of Conservation Concern

The BCC species list (USFWS 2021) was reviewed to determine which species may occur in the project area. Species and habitats that potentially occur within the project area are incorporated and effects are disclosed in this analysis. Table 39 lists the BCC species found within Bird Conservation Region 10 which includes the Northern Rocky Mountains exclusively within the United States, and within which the Ochoco National Forest is located. This list identifies species, subspecies, and populations of migratory and resident birds not already designated as federally threatened or endangered that represent the highest conservation priorities and are in need of additional conservation actions.

In addition, Altman and Bresson (2017) developed a strategy for achieving functioning ecosystems for landbirds through the use of habitat requirements of "focal species" highly associated with specific attributes or conditions within each habitat type. The rationale for identifying focal species is to target the habitat attributes most in need of conservation or most important in a functioning ecosystem. By managing for a group of species representative of important components in a functioning ecosystem, many other species and elements of biodiversity would also be conserved.

Table 40 displays habitat types in the project area that may be impacted by proposed project activities and the corresponding focal species identified by the Conservation Strategy for Landbirds and Associated Habitats and Ecosystems in the Northern Rocky Mountains of Oregon and Washington (Altman and Bresson 2017).

Environmental Consequences - Birds of Conservation Concern

Table 39: Birds of Conservation Concern (BCC) species as identified by the U.S. Fish and Wildlife Service within Bird Conservation Region 10 Northern Rockies U.S. portion only that are known or likely to occur within the North Fork Crooked River project area and have potential to be impacted by the proposed

actions. Species that are analyzed in other sections of this document (e.g., owls and cavity excavators) not included.

BCC Species	General Habitat Requirements	Impacts to Habitat	
		Alternative 1	Alternatives 2 and 3
Rufous hummingbird *Selasphorus rufus*	In Oregon, found in a variety of habitats, but prefers to breed in wooded habitats with high canopy and mature understory.	Continued wide-spread encroachment of conifers and shading out of understory forbs and flowering plants.	Treatments that help promote canopy gaps and productivity of forbs and flowering plants such as commercial harvest, noncommercial thinning, and prescribed fire would improve foraging and reproductive habitat for this species.
calliope hummingbird *Stellula calliope*	Predominantly a montane species found in open shrub sapling seral stages (8–15 years) at high elevations and riparian areas.	Continued decline of riparian areas and shrubs as a result of conifer encroachment.	Treatments that decrease encroachment by conifers would enhance shrub habitat.
pinyon jay *Gymnorhinus cyanocephalus*	In Oregon, found in juniper juniper-ponderosa pine transition, and ponderosa pine edge forests.	Continued overstocking of stands and reduction of edge habitat.	Treatments that help promote canopy gaps and productivity of cone production such as commercial harvest, noncommercial thinning, and prescribed burning would improve foraging habitat for this species.
olive-sided flycatcher *Contopus cooperi*	Open conifer forests (<40% canopy cover) and edge habitats where standing snags and scattered tall trees remain after a disturbance.	Continued overstocking of stands and reduction of edge habitat.	Thinning and burning in a mosaic pattern would increase edges and openings for foraging habitat. Reduced density of open roads would promote snag retention.
evening grosbeak *Coccothraustes vespertinus*	Found in a variety of habitats depending on region. In the northwest, can be found in ponderosa pine, Douglas fir/western hemlock, mixed conifer, and subalpine-fir forests.	Continued overstocking of coniferous stands and over-time reduction of shrub component leading to lower foraging potential.	Treatments that help promote canopy gaps and productivity of cone production such as commercial harvest, noncommercial thinning, and prescribed burning would improve foraging habitat for this species.
Cassin's finch *Carpodacus cassinii*	Open, mature coniferous forests of lodgepole and ponderosa pine, aspen, alpine fir, grand fir, and juniper steppe woodlands.	Continued overstocking of stands with increased competition leading to longer timelines in the	Treatments that help promote the future growth of late and old structure such as commercial harvest, noncommercial thinning,

biased ✱ Commercial logging of Rufous hummingbird habitat would reduce forest habitat suitability as they select for "wooded habitats with high canopy and mature understory, which would usually be removed by commercial logging. This analysis for birds of conservation concern is very biased toward logging. We agree that non-commercial thinning and prescribed burning could be helpful.

✱ 2) Juniper and Juniper-Ponderosa pine and Ponderosa pine edge forests would all be degraded by commercial logging for Pinyon jay, as productivity of cone harvest is reduced with less mature cone-bearing trees. Juniper is especially being targeted for removal

✱ 3) The same critique of the analysis for Pinyon jay is relevant to the Evening grosbeak. Commercial logging would likely reduce suitability of grosbeak habitat, while NOTing and burning could improve it.

4) ✱ Re: Cassin's finch, commercial logging planned would not necessarily promote the future growth of late and old structure because logging would remove already diminished mature forest trees that would otherwise develop into LOS, and alt. 2 would remove the few remaining large Grand firs.

BCC Species	General Habitat Requirements	Impacts to Habitat	
		Alternative 1	Alternatives 2 and 3
		development of mature forest structure.	and prescribed burning would improve nesting and foraging habitat for this species.

Table 40: Effects to habitat types and their associated focal species as identified by the Conservation of Landbirds and Associated Habitats and Ecosystems in the Northern Rocky Mountains of Oregon and Washington that are known or likely to be present within the North Fork Crooked River project area and have potential to be impacted by the proposed actions.

Focal Species	General Habitat Requirements	Impacts to Habitat	
		Alternative 1	Alternatives 2 and 3
white-headed woodpecker *Dryobates albolarvatus*	Dry Forest: large patches late-successional forest with heterogenous canopy.	Analyzed in "White-Headed Woodpecker."	Analyzed in "White-Headed Woodpecker."
flammulated owl *Psiloscops flammeolus*	Dry Forest: interspersion herbaceous openings and patches of dense sapling/pole trees.	Analyzed in "Raptor Habitat."	Analyzed in "Raptor Habitat."
chipping sparrow *Spizella passerina*	Dry Forest: open herbaceous understory with scattered sapling pines.	Continued overstocking of stands leading to a decrease in already sparse habitat.	Thinning and burning would increase forest mid- and understory openings and reduce stocking levels of stands, improving habitat conditions for this species.
Lewis's Woodpecker *Melanerpes lewis*	Dry Forest: large snags.	Analyzed in "Primary Cavity Excavators."	Analyzed in "Primary Cavity Excavators."
Williamson's sapsucker *Sphyrapicus thyroideus*	Mesic Mixed Conifer Forest: large snags.	Analyzed in "Primary Cavity Excavators."	Analyzed in "Primary Cavity Excavators."
✱ **Townsend's warbler** *Setophaga townsendi*	Mesic Mixed Conifer Forest: high canopy cover and foliage volume.	Continued increase of Douglas-fir and grand fir understory providing more nesting and foraging habitat.	Thinning treatments would decrease understory fir species, decreasing foraging and nesting habitat for this species.
✱ **Nashville Warbler** *Leiothlypis ruficapilla* and	Mesic Mixed Conifer Forest: patches of dense understory shrubs.	Continued increase of Douglas-fir and grand fir understory providing more nesting and foraging habitat.	Thinning treatments would decrease understory fir species, decreasing foraging and nesting habitat for this species.

✱ We are very concerned about commercial logging effects to Townsend's warbler, which I haven't seen for many years, and Nashville warbler, which I may have mistaken for MacGillivray's warbler, but otherwise have never seen.

not be burned simultaneously or in a contiguous block, so refugia would exist across the project area where these species would be expected to persist.

Livestock grazing as authorized by the Big Summit, Deep Creek, Fox Canyon, Little Summit, North Fork, Roba, and Wolf Creek AMPs is ongoing within the cumulative effects boundary and may impact birds of conservation concern or their habitats. Livestock grazing may cause shifts in plant species composition and abundance through the selection of more palatable forage species, reduce ground cover through trampling or consuming vegetation, and decrease insect availability for foraging birds. However, current grazing strategies within the projects listed above include adaptive livestock management that is expected to improve livestock distribution and further improve habitat conditions for birds in localized riparian and sensitive areas. These improvements to grazing management should contribute beneficially to the overall cumulative effects.

Together with other landscape objectives that limit or discourage large fires and insect outbreaks, the North Fork Crooked River project would help protect existing late and old forest structure from these disturbances. However, these same treatments would contribute to a negative trend in dead and defective wood habitat across the Forest. These treatments, combined with hazard tree removal along roads and trails as a result of new or ongoing/existing projects, would alter or remove some potential nesting, roosting, and foraging snags.

Therefore, the combined effect of the proposed action alternatives from the North Fork Crooked River project, with these current and reasonably foreseeable actions would be that the effects to birds of conservation concern and/or focal species and their habitats would result in a slight positive trend in habitat for some species (e.g., species that prefer open or riparian forest conditions) and a slight negative trend for others (e.g., species that prefer closed forest conditions) at the cumulative effects boundary scale.

Forest Plan Consistency

The North Fork Crooked River project is consistent with the Oregon-Washington Partners in Flight Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington (Altman 2000, Altman and Bresson 2017), the 2001 updated requirements contained in Executive Order 13,186, and the USFS and USFWS agreements regarding responsibilities of federal agencies to protect migratory birds (USFS 2008, 2014, 2016). ⓐ What are the 2001 updated requirements re: responsibilities of federal agencies to protect migratory birds? Please send me a hard copy by mail of the 2001 updated requirements in Executive Order 13,186 and USFS 2008, 2014, 2016. See EA p. 92, under "Forest Plan Consistency."

Summary of Environmental Effects to Wildlife Species

Wildlife species may exhibit a variety of responses to the proposed management activities. These activities would potentially alter habitat conditions in the short-, mid- and long-term, resulting in either adverse or beneficial effects to terrestrial wildlife or their associated prey species. Intensity of effects may differ depending on context (e.g., location, extent, and timing of activities and the species involved).

Habitat is discussed in terms of existing as well as historic conditions. HRV is used as a reference condition; effects on habitats are discussed, with the assumption that if appropriate habitat is available for a species, then that species occupies or could occupy the habitat. In addition, by managing habitat within HRV it is assumed that adequate habitat would be provided to ensure population viability for those species that would have occurred here historically (Landres et al. 1999). Managing for historic conditions is expected to provide for resilience, even in the face of climate change, because these forests have persisted through past climatic fluctuation and multiple disturbance events (Larson and Churchill 2012, Youngblood et al. 2004). Managing for HRV is expected to result in a reduction of habitat suitability for those species relying on dense forest types while increasing habitat suitability for those species dependent on open mature pine-dominated habitat. Table 41 is a summary of the environmental effects/impacts from the North Fork Crooked River project on terrestrial wildlife species and their habitats.

Table 41: Summary comparison of environmental effects to wildlife resources.

Species	Effects or Impacts Determinations	
	Alternative 1	Alternatives 2 and 3
Threatened, Endangered, Proposed, and Candidate Species		
gray wolf	No Effect	May Affect, Not Likely to Adversely Affect
wolverine	No Impact	No Impact
USFS Region 6 Sensitive Species		
white-headed woodpecker	No Impact	May Impact Individuals or Habitat/Beneficial Impact
western bumble bee	No Impact	May Impact Individuals or Habitat
Morrisoni bumble bee	No Impact	May Impact Individuals or Habitat
Lewis's woodpecker	No Impact	No Impact
silver-bordered fritillary	No Impact	No Impact
monarch butterfly	No Impact	No Impact
bald eagle	No Impact	May Impact Individuals or Habitat/Beneficial Impact
grasshopper sparrow	No Impact	No Impact
greater sage-grouse	No Impact	May Impact Individuals or Habitat
bufflehead	No Impact	No Impact
tricolored blackbird	No Impact	No Impact
upland sandpiper	No Impact	No Impact
American white pelican	No Impact	No Impact
horned grebe	No Impact	No Impact
Townsend's big-eared bat	No Impact	May Impact Individuals or Habitat
spotted bat	No Impact	May Impact Individuals or Habitat
fringed myotis	No Impact	May Impact Individuals or Habitat
fir pinwheel	No Impact	May Impact Individuals or Habitat
white-tailed jackrabbit	No Impact	No Impact
Management Indicator Species		
primary cavity excavators	Consistent with Forest Plan and Continued Viability is Expected	
pileated woodpecker	Consistent with Forest Plan and Continued Viability is Expected	
Rocky Mountain elk and mule deer	Consistent with Forest Plan and Continued Viability is Expected	
golden eagle and prairie falcon	Consistent with Forest Plan and Continued Viability is Expected	
bald eagle	Consistent with Forest Plan and Continued Viability is Expected	
Other Species or Habitats in the Forest Plan		
raptor habitat	Consistent with Forest Plan and Continued Viability is Expected	
hawks and owls	Consistent with Forest Plan and Continued Viability is Expected	
northern goshawk	Consistent with Forest Plan and Continued Viability is Expected	
pronghorn antelope	Consistent with Forest Plan and Continued Viability is Expected	

Re: "Effects or Impacts Determinations" in Table 41: ⊛ this listing of Management Indicator species & "other species or Habitats" is ridiculous, unprofessional & inadequate

⊛ The Forest Service simply can't legitimately dismiss so many wildlife species with the unscientific catch-all of "Consistent with Forest Plan and Continued Viability is Expected" see p. 9 Table 4

⊛ Consistency with the Forest Plan (which is very outdated) does not guarantee that continued viability is ensured or "Expected" which seems to be an easy *everything encompassing weasel word to avoid detailed analysis and harmful consequences. Otherwise, there wouldn't be so many species declines.

Species	Effects or Impacts Determinations	
	Alternative 1	Alternatives 2 and 3
Connectivity Corridors		
Connectivity Corridors	Consistent with Forest Plan direction, allowing for connectivity between LOS	
Birds of Conservation Concern		
Birds of Conservation Concern	Goal of managing habitat within HRV. It is assumed that adequate habitat would be provided for those species that would have occurred here historically although there will be a decrease of habitat for some while habitat will increase for others.	
Focal Species and Essential Habitat	Goal of managing habitat within HRV. It is assumed that adequate habitat would be provided for those species that would have occurred here historically although there will be a decrease of habitat for some while habitat will increase for others.	

Re: Table 41, EA p.94:
⊛ The HRV goal for management of birds of Conservation Concern allows the Forest Service to dismiss the habitat needs of denser forest-dependent bird species as "a decrease of habitat for some," which is now a consistent agency bias against most warblers and other birds requiring denser forest &/or multi-layered canopy.

Botany

The Botanical Biological Evaluation and Invasive Plant Report have been incorporated into the EA. Exhibits are located in the project file.

Regulatory Framework

FSM 2670 directs the Forest Service to manage sensitive plants to ensure population viability and prevent downward trends that would lead toward federal listing (FSM 2672.1, 1995). To this end, a biological evaluation (Botany Exhibit in the project file) analyzes effects of the project to sensitive plant species according to direction in FSM 2670. Species which are not suspected to occur within the analysis area, or are eliminated from consideration due to other factors, are not considered in the detailed effects analysis [as per 40 CFR 1500.4, 40 CFR 1500.1(b)]. Information on these species is available at the Paulina Ranger District office of the Ochoco National Forest.

Methodology

Pre-field review and project surveys inform the analysis process. Pre-field review includes current botanical records and previous surveys in the Forest Service's Natural Resource Manager (NRM) database and at the district office. Habitat data from forest GIS databases are queried for potential and suitable habitat for at-risk plant species. Field surveys were conducted in the field season of 2022.

Information Sources

Data sources for this analysis include the Forest Service's NRM database, which stores sensitive plant species population and spatial data; the Interagency Special Status/Sensitive Species Program (ISSSP) which provides the at-risk species listing for each Forest Service and BLM unit in Region 6; and the Oregon Biodiversity Information Center (ORBIC) database which houses state ranked at-risk species.

Effects Boundaries

The analysis area for this project is based on the area of the project's influence/impacts on documented occurrences or suitable habitat for at-risk plant species. The analysis area is confined to the project boundary and includes all ground-disturbing activities related to this proposed project.

The temporal bounds may be up to twenty years after project implementation for trees to fully respond to their changed environment post-implementation. The recovery of individual plants and populations after a

disturbance event is species-specific and may depend on the disturbance type and its effects to the microsite, the tolerance of the species to disturbance and the species methods of reproduction.

Many sensitive plant species may be rare due to dispersal limitations or limited habitat. Maintaining viable populations at the watershed level contributes to viability across the range of the species. Overlapping or nearby projects which are within the watershed and may have effects to at-risk plant populations are included in the cumulative analysis. Analysis of effects is bounded in time by twenty years after project implementation.

Resource Indicators and Measures

The resource indicators and measures used to quantify effects are summarized in Table 42. The definition and applicability of each resource indicator is discussed in the respective Existing Condition sections below. Sensitive species which occur in suitable habitats but are not documented in the project area will be analyzed at the habitat level instead of specific impacts to potential plants.

Table 42. Resource indicators and measures for assessing effects to botanical resources

Resource Indicator (plant populations or suitable habitat)	Measure	Used to address: P/N or key issue?	Source (LRMP S/G; law or policy)
Riparian/wet meadow/GDE	Populations or acres of habitat affected.	No	FSM 2670
Upland forest	Populations or acres of habitat affected.	No	FSM 2670
Juniper woodland/ sagebrush steppe/ scabland	Populations or acres of habitat affected.	No	FSM 2670
Rock cliff	Populations or acres of habitat affected.	No	FSM 2670

⊛ We found at least two sites that have Henderson's needlegrass (which we called "Ricegr
in two sale units - see our photos of this plant and the associated Survey sheets.

Existing Conditions

There are no documented occurrences of federally listed endangered or threatened plants within the NFCR project area. There is no habitat recognized as essential for listed or proposed plant species recovery under the ESA (USDA Forest Service 2021b) on the Ochoco National Forest. There are 47 sensitive species on the Regional Forester's Sensitive Species List (USDA Forest Service 2021b) that are documented or suspected to occur on the Ochoco National Forest. Based on occurrence records, survey data and habitat information, only those sensitive species occurring or potentially occurring in the project area are considered for analysis. Those species that are not documented but have suitable habitat in the project area will be analyzed at the habitat level. Table 43 lists documented at-risk plant populations.

Table 43: Regional Forester Sensitive Species documented in the NFCR project area

Species	Habitat Description	Habitat Category	Sites In Project Area
Achnatherum hendersonii Henderson's needlegrass	sagebrush scablands	sagebrush scablands	24
Calochortus longebarbatus var. *peckii* Peck's mariposa lily	vernally moist meadows, streambanks	forested riparian stringers	20
Lomatium ochocense Ochoco lomatium	sagebrush scablands	sagebrush scablands	1

⊛ Why isn't there any discussion specific to Moonwort species, that are very rare and hard to detect, which could exist in the NFCR planning ar

Riparian/Wet Meadow/Groundwater Dependent Ecosystems Suitable Habitat

Moonworts (Botrychiums) should have been analyzed for specific potential effects.

Riparian habitats in the project area occur in forested stringers, deciduous hardwoods, wet meadows, and groundwater dependent ecosystems. More information on these specific habitats can be found in Botany Exhibit in the project file. The sensitive plant species associated with riparian habitat can be found in Botany Exhibit in the project file. Riparian habitat has declined in extent and suitability for many sensitive plant species due to the impacts described below.

Past management in the analysis area, including timber harvest, livestock use, beaver removal in riparian systems, the 1964 flood, stream channeling, fire suppression, wildfires, and road construction all have resulted in areas of degraded riparian conditions and altered hydrologic regimes, shifted competition between species, and changed canopy closure. The 1964 flood and subsequent channelization altered the fluvial landforms within valley bottoms. This changed potential vegetation types within riparian areas, and the amount of sedge-dominated, mesic meadow and woody deciduous vegetation was significantly reduced.

Many stream channels are wide and incised, thus losing floodplain area and the associated vegetation that depends on high water tables. Stream banks are exposed from soil loss that was provided by willow and sedge root systems. As stream channel morphology has changed and degraded over time, so has suitable habitat.

Peck's mariposa lily (*Calochortus longebarbatus* var. *peckii*) is a Regional Forester's Sensitive Species (RFSS) and listed on ORBIC List 1 as threatened with extinction throughout its range at the state level. Peck's mariposa lily is an endemic species with a global distribution restricted to Central Oregon. There are twenty populations of Peck's mariposa lily occupying 425 acres within the NFCR project area. Five populations were revisited in 2022 occupying approximately seventy-five acres.

Throughout its range, Peck's mariposa lily occurs mostly on the Ochoco National Forest (87%), with a few populations on the Malheur National Forest (8.5%) and Prineville BLM (4.5%). Peck's mariposa lily is found primarily in two habitat types: narrow riparian strips along seasonal streams in stringer forests, and open moist meadows. Very wet meadows and wetter portions of moist meadows tend not to support Peck's mariposa lily; however, the drier margins of these meadows and meadows that are seasonally moist or moist overall tend to support the largest populations of the lily.

These habitats have changed over the last one hundred fifty years. Effects of road construction, stream down-cutting and disconnection from floodplains, lowered water tables, reduced water storage in floodplains and meadows, soil compaction and displacement, direct destruction of plants from heavy equipment and grazing, livestock hoof action, dispersed camping, increased conifer tree density in riparian areas, decreased stream discharge due to interception by dense conifers, plant composition changes due to overgrazing of riparian vegetation, seeding of exotic grasses for soil retention and forage, and displacement of native riparian species by non-native species.

Long-term drought associated with climate change is a threat to Peck's mariposa lily. Dewey (2011) notes that the species is sensitive to shifts in moisture and appears to have specific moisture requirements, thus lack of water may have an adverse impact on Peck's mariposa lily populations compared to other plant species. Conversely, the drying of wet meadows and riparian areas resulting from habitat alteration may have contributed to an expansion of moderately moist conditions suitable for Peck's mariposa lily due to the transition of native riparian species out of the ecosystem. Drought and dewatering can favor invasive plants and trigger shifts in the species composition of plant communities. In some cases, this shift is notable by comparing plant lists in occurrence records for Peck's mariposa lily. Plants requiring more water such as cow parsnip were recorded in earlier records but are absent from the same sites today. Similarly, the invasive ventenata grass now occupies several Peck's mariposa lily sites where it was not previously recorded. Ventenata may compete with Peck's mariposa lily and native bunchgrasses for early season moisture.

Environmental Consequences – Riparian/Wet Meadow/Groundwater Dependent Ecosystems Suitable Habitat

Direct and Indirect Effects

(*) indicates our written concerns & supporting EA text.

(*) In our 2023 spring field surveying, we may have passed Peck's Mariposa Lily without recognizing it. We are concerned by Peck's Mariposa Lily being threatened with extinction throughout its range. We are also deeply concerned about Peck's Mariposa Lily being an endemic species with 87% of the species' occurrence and all the FS "projects" that could have negatively affected it, including timber sales, cattle grazing, road work, heavy equipment use, decreased stream plants, lowered water tables, reduced water storage in meadows and flood plains, as well as dense young tree in-growth, seeding of exotic grasses, and exotic invasive plant dispersal and establishment - most of which can be seen in the NFCR project area.

Alternative 1

Under the no action alternative, there would be no ground disturbance resulting from project activities affecting sensitive plants and their habitat. Recurring management activities, such as livestock grazing, fire suppression, invasive species treatments using chemical, manual, or biological controls, and public recreation would continue throughout the NFCR project area.

Stringer forests along streams, floodplains, and meadow edges would remain in a dense and overstocked condition, providing excessive shading and competition to sensitive plant populations, such as Peck's mariposa lily, and reducing habitat suitability. High tree densities and ladder fuels would continue to contribute to an elevated risk of severe wildfire in sensitive plant habitat.

Over the next twenty years, sensitive plant populations and suitable habitat may decline due to lowered water tables and along some streams due to increasing channel incision. Decline in quality habitat along intermittent streams means loss of habitat for cleaving moss, which grows on moss covered rocks in intermittent streambeds. Conversion from riparian plant communities to upland plant communities would continue along stream reaches proposed for restoration. Loss of hardwood communities with increasing conifer encroachment would continue, causing loss of habitat for sharp tipped moss and other nonvascular epiphytes that grow on aspen. ❸We are concerned by all the potential impacts from

Alternatives 2 and 3 commercial logging in particular to Peck's mariposa lily, including extensive use of heavy equipment on thousands of acres, with soil compaction, ground disturbance, slash piles, landings,

Vegetation Treatments

Short-term impacts (three to five years) to suitable habitat include soil disturbance from heavy machinery and crushing of plants by machinery or tree felling. Soil compaction and disturbance caused by logging activities can render habitat unsuitable or change hydrologic patterns in riparian habitat resulting in microsites becoming too wet or too dry or burying plants in soil or sediment deposits. Slash piles resulting from both commercial and noncommercial thinning activities can bury undocumented rare plant populations. Areas of exposed soil resulting from commercial thinning operations increases risk of non-native invasive plant establishment in riparian plant communities and can render habitat unsuitable for sensitive plants. These potential short-term negative impacts would be counterbalanced by long term (up to twenty years) beneficial effects. Commercial and noncommercial thinning would reduce conifer density and canopy shading in riparian suitable habitat and would mimic historic stand conditions with which sensitive plant species evolved. While regeneration harvests appear to have detrimental effects to Peck's mariposa lily, a partially open canopy appears to be beneficial (Dewey, 2011). Similarly, moonworts can be found under lodgepole pine and other conifers within wet meadows. There is typically partial shading in these habitats, which is thought to be beneficial to the species. When partially shaded sites succeed to closed canopy sites, moonwort populations may disappear (Ahlenslager and Potash, 2007). much more beneficial to Peck's

Resource protection measures would be implemented in alternatives 2 and 3 that coincide with suitable habitat for riparian sensitive plant species. These measures include stream buffers and avoidance of wetlands and other sensitive areas. These resource protection measures would avoid all known wetlands and springs from heavy equipment operations associated with vegetation treatments. These measures would protect undocumented populations of sensitive riparian plants that require perennial moisture and the much of the suitable habitat for riparian sensitive plants that are facultative wetland species. Vegetation treatments in alternatives 2 and 3 would have no impacts to documented obligate riparian sensitive plant species.

Sensitive plant species that occupy drier meadows and drier riparian plant communities along seasonal and intermittent creeks, especially Peck's mariposa lily, would experience both short and long-term impacts resulting from the action alternatives. Like wet riparian species, drier riparian species could be impacted by vegetation management activities such as described above with ground disturbance – crushing and burying plants. Suitable habitat for cleaving moss could be similarly affected.

The conservation strategy for Peck's mariposa lily (Dewey, 2011) recommends a 50-foot no-activity buffer on population boundaries for heavy equipment and logging operations, to avoid direct damage from heavy equipment and ground disturbing activity. The result is tree densities exceeding the historic range of variation

❸ Drop the planned commercial logging in this sale area, for many reasons, including protecting declining Peck's mariposa lily, which exists on at least 425 acres within the NFCR project area, with possibly undetected populations.

and preference for only use of non-commercial thinning and prescribed underburning

introduction and dispersal of invasive plants, and loss of water retention. Non-commercial thinning and prescribed burning as

While commercial logging could destroy many of the plants in a stronghold for the species. The EA text on p. 97 appears to support our conc

in Peck's mariposa lily populations and habitat. In areas where proposed commercial thinning overlaps with documented Peck's mariposa lily populations in alternatives 2 and 3, either a 50-foot no-activity buffer or a 50-foot minimal-ground-disturbance buffer is proposed, based on unit conditions as determined by the district botanist. Maintaining the 50-foot buffer versus a smaller buffer is due to the risk of weed introduction and spread. A no-activity buffer would restrict equipment activity in Peck's mariposa lily populations. The minimal-ground-disturbance buffer would restrict ground-based equipment operations but would allow machinery to reach trees from the buffer edge. This results in trees being thinned along the edges of the habitat within the buffer with minimal ground disturbance. Some ground disturbance may occur due to treetops sweeping the ground surface as they are removed, but no skidding would take place within the minimal-ground-disturbance buffer. Hand treatments and lop-scatter would also be allowed in either circumstance. Alternative 3 proposes less commercial harvesting in Peck's mariposa lily populations than alternative 2 and proposes non-commercial harvesting in many of those units instead. There are 75 units in alternative 2 that contain or are within 50 feet of Peck's mariposa lily populations. There are 87 units in alternative 3 that contain or are within 50 feet of Peck's mariposa lily populations. A table of specific units can be found in Botany Exhibit in the project file.

In alternatives 2 and 3, stream buffers in commercial thinning units would protect Peck's mariposa lily plants and suitable habitat from the impacts of ground-based equipment. In the portion of the RHCA closest to the stream channel, the harvest would generally leave more canopy cover, in accordance with individual RHCA unit prescriptions. A total of 57.4 acres of occupied Peck's mariposa lily habitat would be commercially thinned in Alternative 2 (122.4 acres in non-commercial thin units) and 25.8 acres in proposed commercial thin units (313.7 acres in non-commercial thin units) in Alternative 3.

Fuels Treatments

Fuels and slash generated from vegetation management activities would be treated within occupied and suitable sensitive riparian plant habitat. This includes hand piling, grapple piling, under burning, and pile burning described earlier in this EA. In the short-term, burning slash piles can sterilize soils, and damage native plants, mycorrhizal fungi and sensitive plant habitat at the slash pile sites. The larger the pile, the greater the impact to soils and suitable habitat. While these effects are highly localized, they can persist into the long term if soils are severely impacted. Long term beneficial effects to sensitive plant habitat include a reduction in fuels and high severity wildfire risk (Arkle and Pilliod, 2010). Prescribed fire would take place in either the fall after native plants have gone dormant, or in the spring, when moisture levels are likely to preclude fire from carrying through habitat. Over the long-term, prescribed fire and under burning would benefit Peck's mariposa lily habitat due to reduction of hazardous fuels, reduction of competing vegetation, stimulation of natural growth response, and simulation of the natural fire regime. Fires that were not excessively hot or dry pose no serious threat to moonworts (Johnson-Groh and Farrar, 1996). However, exceptionally hot burns or burns occurring on desiccated soil can kill moonworts or the mycorrhizae they depend on. Direct ignition would not occur in riparian habitats, although the fire would be allowed to encroach and burn in a natural pattern. Prescribed fire operations are conducted when conditions are unlikely to result in severe burning.

Alternatives 2 and 3 have similar acres of fuels treatments (Table 2 and Table 3). The overlap between Peck's mariposa lily populations and proposed fuels treatment units is relatively small for both alternatives and would occur post-vegetation harvest. Resource protection measures would apply in occupied Peck's mariposa lily habitat, including avoidance of grapple piling and coordination of hand piling and lop and scatter treatments in coordination with the district botanist. These measures would minimize disturbance and soil impacts in Peck's mariposa lily habitat.

The district botanist would review burn plans prior to implementation and would work with fuels specialists to ensure sensitive plant populations and habitat are considered in fuels treatments and prescribed fire implementation. This process would minimize potential damage to sensitive plants and suitable habitat resulting from high severity burning or inappropriate ignition patterns. All units in both action alternatives

"On other Blue Mountains Forests, after a 100 foot buffer is used to protect Sensitive plant populations, not just 50 feet.

We support alt. 3 not including any commercial logging in Peck's Mariposa lily populations and using non-commercial thinning and/or prescribed burning instead. Any small trees in Peck's mariposa lily habitat (up to 9" dbh) should be handfelled and potentially lopped and scattered, but not dragging the trees out of the buffer zone.

Drop all commercial logging in the 57.4 acres under alt. 2 and the 25.8 acres under alt. 3. Any commercial logging in RHCAs should be completely dropped, not only to help protect Peck's Mariposa lily but also to protect and restore other Sensitive riparian-associated and obligate plants, as well as to protect and restore riparian habitat for Redband trout and Sensitive Columbia Spotted frog, and to protect riparian ecosystem processes and functions.

Commercial logging in any of the Peck's [illegible] populations would be a disaster for the species, as it is facing extinction throughout its range.

Obviously, there should be no commercial logging in RHCAs!

We are opposed to prescribed burning during the Spring reproductive season - roughly late April to mid-June

have burning proposed post-harvest. The under-burn only units do not overlap occupied Peck's mariposa lily habitat; however, units 281 and 300 are adjacent to occupied sites.

Sensitive plant habitat for obligate riparian sensitive plant species (slender sedge, retrorse sedge, water thread pondweed, and lesser bladderwort), would receive little to no impact from proposed vegetation management activities. These species are confined to wet, saturated conditions along stream banks, wetlands, GDEs, and other sensitive areas. These habitats are protected by multiple resource protection measures, including the water quality best management practices (BMPs) from the National Core BMPs. Short-term (during and up to one year after implementation) localized sediment increases described in the hydrology analysis could negatively impact the streamside and wetland habitats for these species by disrupting peat forming processes, altering pool formation, or microhabitat features, or by burying undocumented rare plant populations. Prescribed fire would not carry through these saturated habitats, nor would they be directly ignited, and would have minimal effects to undocumented populations or habitat.

Transportation Activities

Transportation activities include temporary roads used for vegetation management, road maintenance and reconstruction, use of haul routes, road closure, and road decommissioning. The transportation activities related to vegetation management vary between alternatives but would result in some disturbance in occupied Peck's mariposa lily habitat. See Table 68 and Table 69 for comparisons of road management activities between action alternatives.

Both action alternatives propose the same temporary roads accessing vegetation units. The temporary roads accessing units 478 and 480, 622, 265, and unit 288 directly lead to or are adjacent to Peck's mariposa lily populations and would need to be shortened by or moved over by 50 feet for the population buffers. Temporary road accessing proposed unit 199.2 bisects a documented population of Peck's mariposa lily. It follows a previously decommissioned road, although it is unknown if any plants have recolonized the old roadbed. Reusing the roadbed as a temporary road would not return it to the productive timber base nor does it allow native vegetation to recolonize the road corridor for pollinators or ecological succession. Winter harvest is recommended for this temporary road location or a relocation of the temporary road. A district botanist would need to confirm presence/absence of Peck's mariposa lily in the decommissioned roadbed prior to temporary road construction to determine impacts. If there are individuals in the roadbed, there would be impacts to individuals but no impact to population or species viability and would not lead to federal listing due to the remaining population surrounding the roadbed.

"The impact area of temporary roads is about twelve feet in width. In the short-term, new temporary roads would remove native vegetation, expose mineral soil, and compact soils directly under the road treads, rendering habitat unsuitable for sensitive plant species. Where temporary roads are within or adjacent to sensitive plant populations or habitat, exposed soils could contribute to soil erosion, increases in sediment input to streams and wetlands, and potential for invasive weed infestation. While the intent is to restore temporary roads to a productive condition, long-term impacts persist in less resilient areas. Restoration methods can bury nutrient rich topsoil and expose mineral soil, mixing up the soil horizons, mycorrhizae, and seed bank. The plant community that returns to the temporary road may not match the cover and native species diversity of the surrounding undisturbed vegetation, making the area less suitable for sensitive plants. These areas are also at greater risk of invasive plant introduction and spread. Temporary roads are revegetated with a native seed mix and further access is prevented, thus limiting some of these negative impacts after successful revegetation. Long and short-term impacts associated with new temporary roads would also apply to temporary roads constructed on existing disturbance. Reusing decommissioned roadbeds does not allow for native plant communities to be fully restored on the landscape, especially if decommissioning does not include restoration of the road corridor to the natural surroundings. The edge effects into the forest canopy continue in perpetuity, changing the microclimate of the habitat by increasing light and temperature and reducing humidity."

Both action alternatives propose to change roads 360, 366, 400 and 4260501 from maintenance level 1 (basic custodial care) to maintenance level 2 (administrative use). Roads 500 and 560 are proposed to be only

(*) Don't reconstruct closed roads that would bisect or "clip the side of separate populations" of Peck's mariposa lily, including roads 366, 500, 360, & 4260501. See EA pp. 99-100, last & first pars.

administrative use as maintenance level 2. Roads 366 and 500 bisect Peck's mariposa lily populations. Roads 360, 400 and 4260501 clip the side of separate populations. It is unknown if individuals have moved into these roadbeds. Road 560, while clipping a population, is proposed to be open to only administrative use. For roads 366, 400 and 500, reconstruction of any road surface is recommended to stop prior to the population boundary, or if the road surface is intact, a closure device is recommended. A district botanist would need to confirm presence/absence of Peck's mariposa lily in the closed roadbeds prior to use and any reconstruction activities to determine impacts. If there are individuals in the roads, there would be impacts to individuals but no impact to populations or species viability and would not lead to federal listing.

Disturbance associated with road closure and decommissioning would have short-term impacts to suitable habitat by creating localized bare soil. Road decommissioning would result in more short-term disturbance than road closure, as decommissioning may involve recontouring, soil decompaction, and culvert removal. These activities result in increased bare soil exposure, risk of invasive plant spread and establishment, and short-term risk for soil erosion and sediment transport. Road closures and especially decommissioning would have a long-term (after five years) positive effect on suitable habitat by helping to reestablish hydrologic function important to riparian habitats. Proposed road closures and decommissions would benefit suitable habitat over the long term by reducing sedimentation, improving surface hydrology, infiltration rates and reducing further compaction as well as reducing the risk for invasive plant spread by vehicle vectors.

(*)

Cumulative Effects (*) We support road closures and especially road decommissioning

Alternative 1 for the reasons cited in par. 2 of EA p. 100, and for other reasons.

Since no action would be taken, no cumulative effects would occur under Alternative 1.

Alternatives 2 and 3

The cumulative effects of past management are reflected in the Existing Condition section. Present and foreseeable actions impacting riparian areas in the project area include the following: livestock grazing, public uses such as recreation, dispersed camping, firewood gathering, OHV use, road maintenance, and invasive plant treatments (Table 5). While many past activities contributed to a departure from historic conditions and ecological processes, such as loss of frequent, low severity wildfire and periodic flooding in meadows connected to stream channels and higher water tables, current and foreseeable management actions are primarily designed to restore these processes or move toward a desired condition of restoration. In most areas where vegetation and fuels treatments would have impacts on riparian sensitive plant habitat, livestock grazing would also be occurring, which includes trampling, utilization of native plants, and habitat degradation due to hoof impacts along stream banks and moist areas. Non-native invasive plant treatments in the riparian habitat within the project area have been minimal within the last five years, but existing infestations of priority weed species would be treated as appropriate through chemical herbicide application and/or manual treatment outside of project activities.

The Fox Canyon and Big Summit Allotment Management Plans (AMPs) that cover much of the project area include several restoration elements and resource protection measures that reduce the impacts of cattle grazing on riparian sensitive plants and suitable habitat. As restoration elements such as protection of GDEs, reconstruction of exclosures, water developments that are designed to draw cattle away from sensitive areas, and riparian restoration activities are implemented, riparian habitat and sensitive plant suitable habitat in the allotments are expected to improve. Over the long term, as riparian restoration actions planned in the AMPs are implemented, habitat connectivity, extent, and quality would improve for sensitive riparian plants.

In most areas where vegetation and fuels treatments and riparian restoration would have impacts on Peck's mariposa lily, livestock grazing would also be occurring. The combination of livestock impacts, which include trampling and direct grazing of Peck's mariposa lily plants, utilization of associated native plants, and habitat degradation due to hoof impacts along stream banks and moist areas, would overlap with the disturbances and impacts described above.

forested matrix. Primary sensitive scabland plant habitat has no or very low tree cover and are typically large, well-formed table lands and ridgelines. Combining primary and secondary suitable sensitive plant habitat overestimates potential habitat in this analysis.

Scablands are an important sensitive plant suitable habitat, providing habitat for seven of the 47 sensitive species, and are one of the few sensitive plant habitats recognized with specific direction in the Ochoco Forest Plan. The Ochoco Forest Plan directs the FS to minimize disturbance in the scablands (USFS, 1989), as mitigation and revegetation are nearly impossible. Scabland habitat has been degraded by road building, gravel pits, livestock grazing, loss of soil biocrust, and invasive species such as Japanese brome and similar annual brome species, medusahead, and ventenata. Ventenata has formed large, nearly monocultural stands on some scablands on the Ochoco National Forest, while other scablands have scattered or patchy ventenata populations or are free of infestations.

Scablands may have functioned as natural fuel breaks due to low fuel loading and influenced the disturbance patch size and burn patterns on the landscape. Scablands with high density ventenata populations could contribute to the spread of uncharacteristic wildfire like how infestations of cheat grass have impacted areas of the Great Basin (Weltz. et al., 2014). Both the high density of exotic annual grass and the higher burn severity could be detrimental to scabland sensitive plant species. There are two main scabland sectors in the project area that harbor larger infestations of ventenata.

Scabland habitat in the project area is grazed by livestock. Habitat degradation resulting from livestock grazing has impacted sensitive plants and habitat. These impacts include grazing of sensitive needlegrass plants, loss of soil biocrust, soil erosion, increased susceptibility to exotic annual grasses, and hoof action in wet soils. ⊛ We are concerned by potential loss of declining Henderson's needlegrass, which is facing extinction across its range.

Henderson's needlegrass (*Achnatherum hendersonii*) is a regional endemic species that occurs sporadically in central and northeastern Oregon. It is on ORBIC List 1. It is found exclusively on central and north-central Oregon scablands (Dewey 2013). There are thirty-nine Henderson needlegrass sites documented on the Ochoco National Forest in the NRM database. Twenty-four (62%) populations of Henderson's needlegrass occur in the NFCR project area. ⊛ We are opposed to any "temporary" road building or closed road re-opening on lithosol "scabland" habitat. Lithosol habitat should be avoided with all heavy equipment, landings, or other ground disturbance. The one documented site of Ochoco lomatium should be buffered and avoided, along with populations of Henderson's needlegrass.

Ochoco lomatium (*Lomatium ochocense*) is an endemic species restricted to basaltic scablands on shallow lithosols. It is on ORBIC List 1. There is one documented site on the Ochoco National Forest which is in the project area; several more sites are located to the south on BLM lands.

Environmental Consequences – Juniper woodland/ Sagebrush steppe/ Scabland

Direct and Indirect Effects

Alternative 1

These habitats would remain undisturbed, and existing vegetation would remain unchanged. Areas of deeper soil and forest ecotones where potential vegetation/fuels treatments would overlap with scablands in the action alternatives would remain undisturbed. These areas would remain with tree densities higher than historic levels, and ladder fuels in these areas may facilitate wildfire to scablands. For scablands already impacted by invasive annual grasses, the occurrence of severe wildfire could exacerbate habitat degradation associated with annual grass invasion. The risk of invasive plant spread, establishment and persistence would remain at current levels. Annual grass infestations would continue to decrease the suitability of scabland habitats for sensitive plants. Disturbance from temporary roads, road closures, and decommissioning would not occur. Continued motorized use would maintain a high risk of invasive plant introduction and spread and risk of unauthorized off-road use of open scabland habitat would continue.

Prescribed burning and other fuels activities would not occur under Alternative 1. Hazardous fuels in surrounding forest stands would remain untreated and would continue to accumulate and put scablands at risk of severe wildfire.

Alternatives 2 and 3

See our photos of what might be Henderson's needlegrass in or adjacent to commercial sale units (at least 2) and our associated survey sheets.

and forested stringers where edge effects are pronounced. There has been past vegetation management which has influenced edge effects in the project area.

Environmental Consequences

Direct and Indirect Effects

Alternative 1

There would be no activities and, therefore, no direct or indirect effects that would change the existing condition. Non-native invasive species would continue to persist at their current rates and could increase through natural means of spread (animals, wind, water) or by humans (vehicles, OHVs, road maintenance).

The no action alternative carries the least amount of risk for invasive species introduction, spread, establishment and persistence, since there would be no entry into forested stands or scablands and no additional areas of ground disturbance. However, invasive species currently present within the project area could potentially spread into disturbed and undisturbed sites. Invasive species are well adapted to disturbed soils and open bare ground. Open roads serve as corridors for spread. Once seeds are dispersed to a new site, the habitat and local disturbance patterns can influence the establishment and persistence of invasive species. Because the no action alternative does not propose entry into recently disturbed areas and no additional ground disturbance related to this project, the risk of introduction, spread, establishment, and persistence for invasive species in the project area would be the lowest of all alternatives.

Alternative 2

Proximity of Activities to Infestations

There are currently 2,152 acres inventoried within the project area, most of which are on roads and in scabland. Of the proposed 11,307 acres of treatment including prescribed burning, 5,456 acres (135 of 393 units) contain or are within 350 feet of an infestation. Of the total NFS roads in the project area, 162 miles (out of 274 miles) contain or are within 350 feet of infestations.

Risk of introducing and spreading weeds into and through the project area is high due to the number of infestations in the project area and the main open roads containing infestations.

Soil Disturbance

Both harvest activities and road activities would disturb the soil. See proposed action for harvest activities and road activities. All these activities causing soil disturbance provide suitable conditions for invasive species colonization.

Risk of establishment from soil disturbance would be moderate in the project area due to the large acreage of harvest activities and the amount of weeds in the project area near proposed units. Seeding of temporary roads and other disturbed areas is a project design feature and would provide competition against new weed infestations from project activities.

Light Availability

Light conditions can be measured by the acres of canopy removal such as timber harvesting and thinning. See proposed action for specific harvest acres by treatment type. Only when the canopy closes would sun-loving invasive species be unable to thrive. Light availability would increase from this project from timber activities such as pre-commercial thin and commercial harvest (acres summarized in Table 46).

Edge effects include increased temperature, increased light, and decreased humidity to the vegetation adjacent to the proposed harvest treatments.

Risk of persistence in areas of increased light availability is high due to the amount of treatment activities in and near scablands, and presence and abundance of weed infestations in the project area. Treatments like commercial harvest and pre-commercial thinning increase light availability and create changes to the local environment, increasing the risk of persistence in forested stringers. Hardwood enhancement may include

1) The existing condition of such extensive invasive plant populations in the NFCR project area is shocking. Houndstongue, Medusahead, and Ventenata grass are the largest infestations, and all three species are difficult to control. It's imperative not to continue extensive ground-disturbing management practices - including commercial logging and road re-opening & reconstruction.

2) We are deeply concerned by the 2,152 acres of invasive plants in the NFCR project area, with 5,456 acres (135 of 393 sale units) containing or within 350 feet of an invasive plant infestation. Most invasive plant infestations are introduced or dispersed via vehicles, roads, and livestock. So the least ground disturbance and the least road re-opening and road construction, the better.

3) Please take heed to Forest Service staff concerns expressed on EA p.111 (see underlining.) The EA analysis supports our many concerns over perpetuating commercial logging & road re-opening and reconstruction, which is usually associated with commercial logging especially in this already severely degraded area. These FS staff concerns are underlined and have * notations. We share these concerns.

removing conifers and planting hardwood species, which would increase light availability in the short term and decrease light availability in the longer term.

Table 46: Resource indicators and measures for the Proposed Action

Resource Element	Resource Indicator	Measure	Alternative 2
Weed introduction and spread	Proximity to infestations	Distance to nearest infestations: number of units/ roads w/in 350 feet of infestations	5,456 proposed acres. 162 miles of NFS roads; 135 of 393 units at high risk of introduction and spread of weeds
Weed establishment	Soil disturbance	Acres of soil disturbance (timber harvest, roads, burning) (roads are 1.82 acres/mile)	11,349 acres of soil disturbance
Weed persistence	Light availability	Acres of canopy cover reduction	11,065 acres of proposed treatment

Alternative 3

The effects to invasive plants would be the same in alternative 3 as they would be in the alternative 2. There is less commercial harvest and more precommercial thinning in alternative 3 than in alternative 2. The risk of introduction, spread, establishment, and persistence of weeds compared to the alternative 2 is about the same with only slight changes (Table 47).

Table 47: Resource indicators and measures for alternative 3.

Resource Element	Resource Indicator	Measure	Alternative 3
Weed introduction and spread	Proximity to infestations	Distance to nearest infestations: number of units/ roads w/in 350 feet of infestations	5,398 proposed acres. 134 miles of NFS roads; 162 of 469 units at high risk of introduction and spread of weeds
Weed establishment	Soil disturbance	Acres of soil disturbance (timber harvest, roads, burning) (roads are 1.82 acres/mile)	11,351 acres of soil disturbance
Weed persistence	Light availability	Acres of canopy cover reduction	11,073 acres of proposed treatment

Cumulative Effects

Cumulative impacts result from the incremental impact of the action **when added** to other past, present and reasonably foreseeable future actions. Timber harvest, road construction, road maintenance and best management practices, fire suppression, and recreation have contributed to introducing or spreading weeds in the project area. Weed treatment is an ongoing activity in the project area.

Alternative 1

Since there would be no direct or indirect effects from Forest Service actions that could contribute to invasive species introduction or spread, there would be no cumulative effects from this project. Ongoing actions, such as road maintenance (mowing, grading, etc.), would still potentially affect invasive species. Infestations within the project area are eligible for treatment under the current invasive species control decisions (USDA, 2012).

* Comparing Table 46 (alt. 2) and Table 47 (alt. 3) on EA p. 112 demonstrates just how very similar to the two action alternatives are, re: invasive plant introduction & spread, invasive plant establishment, and invasive plant persistence, as well as the amount of soil disturbance and canopy cover reduction. The NFCR EA has an inadequate range of alternatives, since the two alternatives share essentially the same footprint with almost the same planned management, with little acreage affected difference. This why alternative 3 is only a starting point for negotiations. The commercial-size logging needs to be abandoned, along with the associated extensive ground disturbance & re-opening of closed roads.

Table 48 provides a summary of resource elements and indicator effects from cumulative activities in the project area.

Table 48. Resource Indicators and Measures for Cumulative Effects

Resource Element	Resource Indicator	Measure	Cumulative Activities
Weed introduction and spread	Proximity to infestations	Distance to nearest infestations: number of units/ roads w/in 350 feet of infestations	2,056 infested acres total
Weed establishment	Soil disturbance	Acres of soil disturbance (timber harvest, roads, burning) (roads are 1.82 acres/mile)	10,569 acres of soil disturbance
Weed persistence	Light availability	Acres of canopy cover reduction	7,402 acres of documented vegetation management

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Soils

The long-term sustainability of forest ecosystems depends on the productivity and hydrologic functioning of soils. Ground-disturbing management activities directly affect soil properties which may adversely change the natural capability of soils and their potential responses to use and management. A detrimental soil condition often occurs where heavy equipment or logs displace surface organics or reduce soil porosity through compaction. Detrimental disturbances reduce the soil's ability to supply nutrients, moisture and air that support soil microorganisms and vegetation growth. The biological productivity of soils is tied to the amount of surface organic matter and coarse woody debris present. Since forest soils are a non-renewable resource as measured by human lifespans, maintenance or enhancement of soil productivity must be an integral part of National Forest management. Therefore, an evaluation of the potential effects on soil productivity is essential for integrated management of forest resources.

This section analyzes the potential effects to short- and long-term soil productivity resulting from the proposed and connected actions within the NFCR Vegetation Restoration project area. Actions addressed in this section include those associated with commercial thinning, prescribed burning, stream restoration and temporary road construction. All of these activities are examined in this analysis because they are potentially ground-disturbing management activities that may adversely affect soil properties and capability.

Methodology

Soil types within the project area are mapped in the Ochoco National Forest Soil Resource Inventory (SRI). A broad-scale initial GIS-based analysis was used to identify potentially-sensitive soil types, to determine erosion risk ratings, inherent site productivity, and other potential limitations, and to determine the likely extent of existing detrimental soil condition. Priority stands were chosen for field evaluation and validation of soil mapping units, slopes, hydrologic characteristics, and other features. Appropriate map changes were made to reflect field observations.

The extent of detrimental soil impacts persisting from previous management activities was characterized via visual walking transect sampling and general field observations. Stands were chosen for field study based on proposed treatment type and past harvest history, and selection focused on stands where a mechanical treatment is proposed. Field data and observations were used, along with documented harvest history and air

There are many areas of disturbed soils (roads, trails) and scabland habitat across the Paulina Ranger District, which provide habitat for invasive species. Past ground-disturbing activities, such as timber harvest, grazing, and road management, have contributed to the introduction and spread of invasive species in the area. Recreational and economic land uses have also contributed to the spread of invasive species since users and their vehicles are vectors for seed spread. Wildlife has likely contributed to weed spread in the past by transporting seeds across the landscape. All these activities will continue.

For all alternatives including the no action alternative, there is the potential for wildland fire. A wildland fire within the project area could increase the risk of spread, establishment, and persistence of invasive species weeds in the project area. Wildland fire would expose bare ground and mineral soil that may be susceptible to invasive species establishment. The areas that would have a higher risk of spread following a wildland fire are adjacent to roads, recreation trails, and fire suppression activities.

Alternatives 2 and 3

Proximity of Activities to Infestations

It is difficult to quantify the amount of traffic on highways, town roads, and NFS roads, although improved roads generally have more traffic than the unimproved roads due to ease of use and accessibility. There are several miles of closed roads and administrative use roads (210 miles) in the project area. Comparatively few roads are non-NFS roads or suitable for passenger vehicles (65 miles). Approximately 23 miles of NFS roads have been treated for weeds in the past (Botany Invasive Exhibit in the project file). Treating these areas decreases weed seed produced, which reduces the seed that could be transported by vehicles, humans, and animals.

Grazing is ongoing in the project area, providing vectors for weed seed dispersal and increasing the risk of introduction and spread across the project area. Livestock moving across the landscape have a high risk of picking up weed seed and dropping it in un-infested areas. Infestations may increase in gross acreage due to new seed introductions from nearby plants.

Soil Disturbance

Past soil disturbance includes road construction and maintenance, timber harvest, grazing, and dispersed campsites. Livestock disturbing the soil increases the risk of establishment for species, which combined with the risk of introduction and spread, may increase the overall weed infestations across the project area.

Fire suppression activities, which have occurred several times in the project area, disturb the soil and provide suitable conditions for weeds. Since 1986, there have been an estimated 97 fire starts, with two large fires in the project area in the past ten years. Each suppression event disturbs soil and increases the risk of introduction and spread of invasive species. The last notable wildland fires in the project area were Fox Fire in 2022 and Stump Springs Fire in 2023, totaling 2,667 acres burned in the project area. These fires mostly occurred in scabland or open habitat, which may have contributed to suitable conditions for weed establishment by burning off native vegetation and providing some soil disturbance via fire and suppression activities.

Light Availability

Past harvesting in the project area increased the number of acres with more light availability from past project activities; there have been about 7,402 acres of documented harvesting on NFS lands in this area since 1983. Some of these acres are located on the same site with multiple harvest entries in different time frames. Generally, acres which are opened by activities are more susceptible to the persistence of sun-loving invasive species than if no activities occurred. Eventually, if the canopy is allowed to close, most infestations would be shaded out.

Canopy cover normally provided by native vegetation has been altered by grazing in the project area, changing the microclimate of the ground layer, and increasing the risk of establishment and persistence.

depth of char within all fire severity classes. Moderate fire severity occurred over 304 acres or 11 percent of the Fox Fire on the ONF and only 1 percent or 19 acres were in the high severity class. These areas have recovered from an effective ground cover perspective which means that ground cover due to vegetation has returned to the pre-fire levels, usually to the 60 to 80 percent level on fires within two to four years depending on fire intensity and severity.

Management Related Disturbances

Livestock Management

The NFCR Project area overlaps with all or portions of the Big Summit, Deep Creek, Fox Canyon, North Fork, Roba and Deep Creek Allotments. Existing detrimental soils conditions assessed for each unit in the NFCR project area included disturbance from livestock, fence lines and associated maintenance area, and water developments.

Vegetation Management

The degree, extent, distribution and duration of soil disturbance can vary with size and type of equipment used for forest vegetation management, the volume and type of material being removed, frequency of entries, soil type, and the soil conditions present when the activity takes place. Soil monitoring on local landtypes and similar soils have shown that for modern-day thinning operations, typically around 20 to 30% of an activity area can be detrimentally disturbed by ground-based harvest systems (Ochoco Soil Monitoring Reports: 2007- West Maurys; 2008 Spears; 2014- Slide and 2019- Edge (Gap).

Disturbance levels for historic harvests may be much higher (Froehlich 1979; Laing and Howes 1988; Zaborske 1989), having detrimentally impacted up to 40% or more of the unit area. Prior to the 1980s, soil quality standards, best management practices (BMPs), and mitigation measures either didn't exist or were less robust for limiting and containing detrimental soil impacts than they are today. The degree of ground disturbance was most often greater than what is acceptable by modern standards. The majority of historic harvests were partial removal and regeneration prescriptions that caused more soil disturbance than modern thinning prescriptions both because the volume removed was greater and because equipment usage was more intensive throughout the harvest area. Forest-wide monitoring data has shown that historic intermediate harvest prescriptions (e.g. selection cut, partial overstory removal) generally resulted in 20-30% detrimental soil conditions. Regeneration harvest prescriptions (e.g. shelterwood, overstory removal) cause slightly more detrimental soil conditions (30-40%), while thinning prescriptions result in less (15-20%). Natural recovery from historic impacts has occurred to varying degrees depending on the inherent productivity and resilience of the sites, but residual impacts remain and are detectable in all of the previously harvested stands. Forest-wide monitoring has shown detrimental soil conditions most commonly associated with timber harvest and plantation establishment include heavy compaction, displacement of topsoil, excessive removal of organic materials, mixing of soil horizons, and a minor degree of severely burned soils (for definitions see Forest Service Handbook, section 2520.8-1, 1998). Heavy compaction and displacement were nearly always observed where there were old roads, landings, primary skid trails, recreational trails, or where repeated passes of heavy equipment had occurred. Severely scorched soils were occasionally observed on landings where slash was burned. In addition to timber harvest, fuels treatment projects have been implemented over the past two decades to reduce fuel loadings and encourage a fire-resistant forest structure.

Overlap of proposed treatment units with previously disturbed areas (data acquired from the FACTS database), aerial photo and LiDAR analysis, and field monitoring data were used to determine estimates of existing detrimental soil conditions (DSC) and soil disturbance classes for each proposed activity unit in the project area. The result of this analysis is summarized in Table 51 below and displayed in its entirety in Appendix D of this EA. There are 266 units (both HTH and NCT-GP) which currently exceed 20 percent DSC. In areas where less than 20 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effect of the current activity following project implementation and restoration must not exceed 20 percent. In areas where more than 20 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effects from project implementation and restoration must at a

1) We are very concerned by proposed further ground disturbance and adding more detrimental soil impacts on top of 266 sale units currently exceeding 20% detrimental soil conditions, the Forest Plan limit.

Please note the importance of protecting soils from detrimental soil impacts in the text on EA p.119 re: "Management Related Disturbances" "Vegetation Management" by the Forest Service soil scientist. (see our underlining & marks on the page.)

Although FSM 2500, R6 Supplement 2500-98-1 exists, it is an unethical loophole that allows for further damage to soils already at the Forest Plan detrimental soil limit. Thus, there is reliance on soil mitigation measures to keep the added soil damage to the 20% limit. Yet the soil mitigations used are not completely effective (e.g. sub-soiling) and are often never fully implemented or effective.

2) The already predicted (by the FS soil scientist) 20% existing detrimental soil impacts in 266 sale units (the damage is obvious in past logged sale units that were converted to young pine plantations by clearcutting & partial removal (clearcut patches)) and illuminates the need not to commercially log those (& other) sale units on top of the existing high levels of detrimental soil impacts and other evident degradation. The sale units planned for NCTing & grapple piled should instead be NCTed by hand & only hand piled, which also applies to the GP units.

The soil destroying loophole ↗

1) ✱ The Forest Service has already subjected this part of the forest to two to three previous commercial logging entries, and the whole area has lots of consequent degradation that is obvious on the ground. You can't expect these already intensively logged areas to fully recover if they are logged again. The Forest Service needs to let the forest grow back into mat and large/old forest structure. This is the case across the Fores but the NFC sale area is particula obviously degraded to the point of no return if logged again.

Commercial Thinning Activities

The use of ground-based equipment for commercial thinning activities has the potential to increase the amount and distribution of soil disturbance within the proposed activity units. The development and use of temporary roads, log landings, and skid trail systems are the primary sources of new soil disturbance that may result in adverse changes to soil productivity. Resource protection measures listed below would be applied to avoid or minimize the extent of soil disturbance at random locations between main skid trails and away from log landings.

The effects of ground-based logging disturbances on soil productivity vary based on soil type, types of silvicultural treatments, duration of activities, and the area disturbed with each entry. The total amount of soil impact also depends on the existing conditions prior to entry, the ability to reuse previously established landings and skid trails, types of equipment used, amount of material removed, operator experience, and contract administration.

* Most soil impacts would occur on and adjacent to temporary roads, log landings and skid trail systems where multiple equipment passes cause detrimental soil compaction and displacement. Skid trails on an average of 100-foot spacing contribute roughly 10-15 percent disturbance in an average unit with landings and roads making up an additional five and two percent, respectively. However, since most of these units have had two to three previous harvest entries there is an existing designated harvest framework upon which this proposed treatment would be largely confined. Resource protection measures would be applied to avoid or minimize soil impacts in dispersed locations between main skid trails and away from landings; for example, adequate skid trail spacing, limiting rubber-tired skidders to skid trails only, and limiting the number of passes made by harvesting machinery. Small areas of displacement or surface mixing resulting from isolated machine maneuvers are often not large enough to constitute detrimental soil displacement (must be at least 100 square feet AND at least five feet in width) under Regional guidelines (FSM 2520). Resource protection measures that, where feasible, limit machine pivots and turns to primary skid trails and focus machine piling or treatment of fuels on what can be reached from primary skid trails help constrain the amount of soil displacement and compaction that occurs. Machine piles and hand piles would also be concentrated on existing disturbances (skid trails, landings, etc.) to minimize the total amount of detrimental soil condition incurred through pile construction and burning.

An estimated 23 miles of new temporary road would be needed to allow access to some of the activity areas proposed for commercial thinning under both Alternatives 2 and 3. [Assuming an average width of 12 feet wide (equals ca. 1.46 acres/mile) X 23 miles = ca. 33.6 acres.] Temporary roads are a short-term commitment of soils resources and would be rehabilitated after use in accordance with the temporary road resource protection measures developed for this project. Temporary roads are built to a low standard, should require negligible excavation, and are not intended to substantively remain after harvest activities are completed. Many of these temporary roads would be located on existing short segments of old access roads from previous entries. Once no longer needed for project activities, these temporary roads would be decommissioned by blocking access, installing waterbars, and/or tilling (scarifying or ripping depending on the soil depth) the running surface. Additional surface cover treatments (mulching, slash placement, large wood placement) may be used to minimize erosion potential, increase revegetation success, and discourage vehicular traffic where needed. Decreased infiltrative capacity, increased erosion risk, reduced vegetative productivity, and reduced microbial habitat potential resulting from new temporary roads are expected to be short-term in nature (lasting five years or less) because of these restoration treatments. Where pre-existing non-system spurs would be reused as temporary roads, a net improvement in soil condition would result from post-activity restoration.

3) ✱ Even where there is an unregenerated skid trail network to re-use, building on existing *

Piling and Prescribed Fire Activities

Pile burning at landings and under grapple piles destroys protective organic matter, volatilizes some elements, transforms elements to soluble forms, and alters the physical, chemical, and biological properties of soils. These soil impacts are relatively small in nature (approximately 3 percent of a unit in landings and another 2 to 5 percent under grapple piles (depending on slash tonnage and distribution) of which many are

✱ decommissioning

✱ So far the Ochoco has a terrible record of not fully decommissioning temporary roads.

✱ The standard soil mitigations for commercial logging listed in par. 3 on p. 121 are much like arranging the deck chairs on the sinking Titanic.

✱ Drop the 23 miles of "temporary road building" along with the associated commercial logging.

cont. 3) * detrimental soil impacts caused, that means whatever recovery has taken place since the last timber sale will be destroyed, which will either set back recovery for decades (or up to 100 years later if there are no further heavy equipment soil impacts), there may be no full recovery for up to 100 years, not 20 years. Bear in mind the first par. of EA p. 114 under "Soils" – the 1st, 2nd, 4th, 5th, & 6th sentences.

2) ✱ Based on the calculation that skid trails contribute roughly 10-15% ground disturbance (detrimental) plus landings and roads contributing an additional 5 & 2%, that means there will be up to 17-22% detrimental disturbance about doubling the existing detrimental conditions from 20% (the Forest Plan limit to up to 37-42% detrimental disturbance way over the Forest Plan limit (see EA p. 121, par. 3)

protecting and conserving soil resources so that long-term site productivity is assured. The effects analysis for the soil resources assumes that all BMPs and RPMs for all resources are fully implemented." Please refer to *Appendix B – Best Management Practices and Resource Protection Measures.*

Soil Tillage

Primary landings and temporary haul roads (new or on existing disturbances) utilized by purchaser/logger would be tilled (scarified) to a depth of 8 to 10 inches. Primary (main) skid trails used by the purchaser are to be tilled for a distance of 300 feet from the landings at the completion of logging activities. The main purpose of tillage is to decompact the soil such that there is an improvement in soil moisture and aeration. Resistance to root growth is lessened also. There are potential short term and long-term effects of tillage. The long term (6 to 50 years or more) effects are largely beneficial due to the improved infiltration, percolation, aeration and lessened bulk density. Short term effects (0 to 5 years) may include increases in localized erosion potential before effective vegetative ground cover is established. This short-term hazard would be reduced by the use of water bars and/or slash placement.

Tillage effectiveness varies widely with soil texture, rock content, depth, water content and type of tillage implement used. Research indicates that some mechanical method to consistently ameliorate compacted soil conditions is desirable and feasible, especially on coarse-textured soils such as ash-capped soils on the Ochoco National Forest (Geist and Froehlich 1994). For landings constructed on coarse and medium textures soils, the evidence thus far indicates that decompaction and decompaction plus topsoil recovery, respectively, appear to be sufficient to restore productivity (Sanborn, P; Kranabetter, M; and Bulmer, 1999). Forest monitoring over the past 30 years has shown that on average, the effectiveness of tillage using a forest cultivator or tractor-mounted subsoiler is about 70 percent for a single pass.

It is widely recognized that ground-based forest harvest systems need a dedicated framework of roads, landings and main skid trails. Depending on the harvest/fuels treatment schedule a minimum amount of these features (approximately 20 percent of the area) are part of a designated harvest framework. Acreage above the 20 percent level is targeted for tillage treatment if tillage operations are feasible. Upon completion of commercial thinning activities, tillage done by the purchaser on the average timber sale comprises three to four percent of an activity unit.

Summary of Direct and Indirect Effects

With implementation of BMPs, RPMs and soil tillage described above, all ground based mechanical activity units would meet soil quality standards upon completion of project activities (FSM 2520, Region 6 Supplement 2500-98-1)[4]. "The DSC class is expected to increase in 2 HTH units (70 acres) but still remain below the 20 percent threshold. 148 HTH units (5,659 acres) would remain above the 20 percent threshold but have a net improvement in soil condition after tillage and restoration treatments. 123 units (3,018 acres) of NCT-GP treatment would remain above the 20 percent threshold but may have no net improvement in soil condition." Table 51 below summarizes the DSC class conditions before and after completion of project activities. Appendix D includes unit by unit DSC and the amount of restoration (tillage), if possible, for each unit.

[4] In areas where less than 20 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effect of the current activity following project implementation and restoration must not exceed 20 percent. In areas where more than 20 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effects from project implementation and restoration must at a minimum, not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality. (FSM 2500, R6 Supplement 2500-98-1)

⊛ It's problematic that: "The effects analysis ~~for soil effects~~ for the soil resources assumes that all BMPs and RPMs for all resources are fully implemented because these Best Management Practices and Resource Protection Measures are not necessarily 100% effective, and often are not fully implemented often due to lack of funding. (EA p. 123, 1st par.)

⊛ Subsoiling only alleviates compaction, not displacement of soils or erosion. Further subsoiling ("tillage") mixes soil layers and organic topsoil may be lost or rocks brought up to the surface (which I have seen.)

⊛ Caveats (underlined above) by the soil scientist cast doubt on the conclusion that "all ground based mechanical activity units would meet soil quality standards upon completion of project activities (FSM 2520, Region 6 Supplement 2500-98-1)." (EA p. 123, last par.) There never seems to be any follow through after timber sale logging to ensure that sale units already with 20% or more detrimental soil impacts would "at a minimum, not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality." (See footnote on EA p. 123)

⊛ This overall result for remaining detrimental soil impacts is not encouraging. This detrimental soil result should be a Forest Plan violation, which perpetuates detrimental soil conditions, foreseeably into the future probably for decades.

1)
*This is honest, but appalling, that 266 sale units over 97% of the NFCR project area would be in the 20-29% class of detrimental soil condition over 8,747 acres - in blatant violation of the original Forest Plan standard. This is the worst outcome I've seen admitted in a Forest Service NEPA document for detrimental soil impacts at 20-29% in 32 years of forest monitoring in eastern Oregon. Will the Forest Service finally recognize that they should not beat the forest soils to death through repeated commercial logging and grapple piling, along with roadwork? There's only so much industrial extraction damage that the Forest can sustain and still be a viable forest ecosystem.

Table 51. Detrimental soil conditions before and after implementation for Alt 2 (proposed action)

Detrimental Soil Condition Class Brackets	Existing Units/Acres/Percent of NFCR Project Area	Post Implementation Units/Acres/Percent of NFCR Project Area
0 percent class (pristine)	0 units / 0 acres / 0%	0 units / 0 acres / 0%
1 to 9 percent class	6 units / 117 acres / 1%	0 units / 0 acres / 0%
10 to 19 percent class	9 units / 222 acres / 2%	15 units / 339 acres / 3%
20 to 29 percent class	266 units / 8,747 acres / 97%	266 units / 8,747 acres / 97%

Cumulative Effects

The spatial boundaries for analyzing the cumulative effects to soils are activity areas (project units), because actions outside the unit boundaries would have little or no effect on soil productivity within the units, and actions within the unit boundaries would have little or no effect on soil productivity elsewhere. An activity area is defined as "the total area of ground impacted by an activity and is a feasible unit for sampling and evaluating" (FSM 2520). The temporal boundaries consider the potential for both short- and long-term effects. Analysis of short-term effects looks at changes to soil properties that would generally recover or revert to pre-existing conditions within five years of completing proposed activities. Long-term effects are those that would substantially remain for five years or longer in the absence of restoration treatments. Both temporal bounds are considered because short-term effects may be visually evident immediately after planned activities but have only short-lived and minor impacts to soil productivity (e.g., low-level shallow compaction that returns to normal levels through freeze-thaw action in a couple of seasons), while long-term effects may persist for years or decades, dramatically affect soil productivity, and be worsened by repeated entries or management actions (e.g., compaction on skid trails that persists from historic harvests and may be worsened by proposed activities).

*This states the kind of long-term detrimental soil impact cause that is being proposed for this sale, i.e. "compaction on skid trails that persists from historic harvests [timber sales] and may be worsened by proposed activities." (EA p.124 1st par.

Alternatives 2 and 3

There are no other vegetation management projects involving mechanical equipment, skid trails or temporary roads that overlap in time and space with the NFCR project.

Existing Condition – Coarse Woody Material

The amount and distribution of downed coarse woody material (CWM) has been affected by past forest management activities and by insect and disease cycles. Lower-elevation ponderosa pine stands historically had very little CWM and litter accumulation, likely because of repeated, low-intensity fires that burned much of the forest floor, consumed down wood, and killed small trees. Mixed conifer stands experienced longer fire return intervals and likely built up greater amounts of CWM between major fires as a result of cyclical pathogen and insect attacks, though most of it was likely consumed during large fires.

3) *We are concerned that with the combination of commercial logging, non-commercial thinning, and prescribed burning, there will not be enough coarse down wood left except in piles that are later burned. See last par. of p.124, 1st 5 lines.

CWM, even in limited amounts, plays many important roles. It is crucial for retaining moisture and moderating soil temperature. It serves as a long-term reservoir for nutrients. It provides surface roughness and complexity that disrupts surface flow and minimizes erosion. It creates microsites that support vegetative diversity. It also provides habitat for a diverse array of fungi and macro-/micro-invertebrates that improve soil structure and quality, cycle organic carbon, and facilitate nutrient cycling. Quantities of CWM are currently sufficient throughout the project area, and in some areas are quite high. While there is not a soils-specific standard and guideline for CWM, the Forest Plan standard for Surface Soil Erosion and Effective Ground Cover (4-196), which can be met through CWM and finer surface organics, is easily met throughout the majority of the project area. Wildlife resource standards and guidelines in the Eastside Screens that speak to CWM recruitment and maintenance are considered sufficient for soils productivity concerns (requiring 15-20 pieces per acre of 12-inch diameter/6-foot length for mixed conifer areas and 3-6 pieces per acre of 12-inch diameter/6-foot length for ponderosa pine areas). Conserving surface litter (e.g. organic materials such as leaves, twigs and branches less than three inches in diameter) is also crucial for protecting mineral soil

*We recommend logging & scattering, no commercial logging (which preserves more large snags & down wood into the future, no prescribed burning in mixed conifer LOS P.habitat & matrix habitat, & no closed road re-opening and "temporary" roads - all of which retain more down wood into the future.

The spatial boundary for analyzing the cumulative effects to CWM is the NFCR Forest Resilience project area because actions outside the project area would have no effect on CWM in the project area, and actions within the project area would have little or no effect on CWM elsewhere.

No past, present, or reasonably foreseeable future actions on vegetation management that have potential to effect CWM (such as mechanical vegetation management) overlap in time and space with the NFCR project area. As described in the direct and indirect effects, the action alternatives would comply with the recommended management guidelines that ensure adequate retention of snags, CWM, and fine organic matter for surface cover, biological activity, and nutrient supplies for maintaining soil productivity on treated sites.

Summary of Environmental Consequences

Table 52 summarizes the environmental effects to soil resources and coarse woody material.

The proposed actions are not expected to create any irreversible damage to soil productivity. No soil would be removed for the construction of permanent facilities, and there is no measurable risk for mechanical disturbances to cause mass failures or landslides. Application of BMPs and RPMs would ensure that all Forest Plan and Regional Soil Quality standards would be met to ensure the long-term productivity of the soil resource.

The development and use of temporary roads and logging facilities is considered an irretrievable loss of soil productivity until their functions have been served and disturbed sites are returned back to a productive capacity. Both action alternatives include soil restoration activities that would improve soil productivity and hydrologic function on detrimentally disturbed soils. All temporary roads used for the project would be scarified or ripped depending on soil depth and rock content. Activity units that exceed Forest Plan standards for DSC after harvest would have restoration treatments (tillage) applied to a portion of those facilities. However, most harvest units would still have some irretrievably committed soil resources in the form of logging facilities (roads, main skid trails and landings) that substantively remain after the project is completed. This is considered an acceptable trade-off to meet ongoing needs for stand management, and existing logging facilities would be used for subsequent entries into the stand.

Table 52. Summary of environmental consequences to soil resources

Resource Element	Resource Indicator and Measure	Alternative 1	Alternatives 2 and 3
Detrimental soil disturbance	The extent of detrimental soil conditions (DSC) within individual activity units proposed for mechanical treatments as measured by the percentage of treatment area in a detrimental soil condition and number of units/acres exceeding 20% DSC	The extent of detrimental soil conditions would not increase above existing levels because no additional land would be removed from production to build temporary roads and logging facilities. Soil quality would not be diminished further, but would remain compromised where roads, trails, and unrehabilitated landings and skidding routes exist. Although disturbed soils would continue to slowly recover naturally from the effects of past management, the current levels of detrimental soil	All ground-based activity units would meet soil quality standards upon completion of project activities, including tillage. (FSM 2520, Region 6 Supplement 2500-98-1). DSC class is expected to increase in 2 HTH units (70 acres) but still remain below the 20% threshold. 148 HTH units (5,659 acres) would remain above the 20% threshold but have a net improvement in soil condition after tillage and restoration treatments. 118 NCT-GP units (3,018 acres) would remain above the 20% threshold but have no net

(*) Cumulative effects occurring are not always dependent on overlapping in time and space, as wildlife are affected by cumulative loss of habitat components across timber sale and watershed boundaries, as wild animals may range great distances, such as wolverine, lynx, wolves, etc. Cumulative effects to soils and down wood should also be considered for across the (*) District and the Forest.

(*2) Not commercial logging in this (land other) area would prevent irretrievably committed soil values in the form of logging infrastructure, including roads, skid trails, and landings that remain, and may take decades to recover. (See EA p. 126, last par.)

(*) ~~Table 52 seems to conflict with Table 51 re: past implementation acres of~~

the timing and intensity of runoff events and has had an effect on base flow through increased discharge of water out of the watershed early in the season that was not retained through infiltration during earlier peak flow events. In incised channels, the increased shear stress of peak flows scour the bed and banks of the channel rather than spilling over onto the floodplain resulting in a lowered water table and decreased base flows. This process creates a condition that lowers water tables and reduces the water available to support riparian vegetation, which has allowed for the establishment of xeric species and an overstocking of conifers. Overstocked conifers in the vicinity of stream channels transpire and further reduce shallow groundwater contributions to streams, thereby reducing base flows and water yield as well. Because of the lack of early season retention, base flows later in the season are lower than they have been historically. The reduced base flows result in less riparian vegetation, and less riparian vegetation results in less bank building through sediment deposition and stabilization, leading to less infiltration of peak flows across floodplains. Timing of peak flows are likely to occur earlier in the year compared to historical observations due to climate change (USDA Forest Service 2022). While the magnitudes of those events can also be related to climate change, legacy and ongoing land-use including channel confinement, grazing activities, harvesting practices, soil loss, soil compaction, road location and maintenance are major drivers. Land management activities can have compounding effects that cause localized and variable hydrologic responses.

Within this project area, there are treatment units within RHCAs. It is important to note that a portion of these units are on sections of stream that are dry during peak summer temperatures even though they are designated as perennial. Sometimes referred to as "interrupted," it is the nature of the streams in the project area to have sections of seasonally dry streambed with perennial sections upstream and downstream from these sections. Since the extent of these dry sections is unknown, whole reaches are designated as perennial. Because these perennially interrupted (dry) sections of streams go dry before peak water temperatures occur in the watershed, similar to that of intermittent streams, they are often managed like intermittent streams. The effects of this are incorporated and disclosed in the stream temperature effects analysis. Historically, Redband trout may have occupied more aquatic habitat within the NFCR project area than presently. Road densities, livestock grazing, timber harvest, and mining have contributed to a reduction in suitable habitat and increased fish passage barriers.

Key Issue

The watershed condition framework (WCF) rates the four subwatersheds in the project area as fair to poor for water quality, aquatic habitat, riparian/wetland vegetation, roads/trails, and fire regime attributes. Proposed activities in RHCAs would follow the management direction from INFISH, in an effort to maintain or restore properly functioning aquatic systems with minimal adverse effects. Alternative 2 would allow site specific commercial and non-commercial harvest in certain RHCAs while alternative 3 would have no commercial harvest in RHCAs. Both action alternatives would benefit RHCAs from a wildfire and climate change perspective, therefore benefiting aquatic biota and habitat. Effects of the alternatives are compared using the following resource indicators and measures (Table 53).

Table 53. Aquatic Resource Indicators and Measures

Indicator	Measure	Source	Standard
Water Quality-- Stream Temperature	Percent riparian shade and stream temperature	RMO - Forest Plan as amended by INFISH; and Oregon Department of Environmental Quality (ODEQ)	>80% riparian shade 7-day average max temp<18° C
Water Yield/Peak Flow	Equivalent Harvest Acre (EHA) Value	Forest Plan	>35% EHA value
Sediment Delivery	Bank stability and percent fine sediment	ODEQ and Forest Plan as amended by INFISH	>80% stable banks <20% fines
Large Wood Recruitment	Relative potential for LWD to recruit into instream habitat	RMO - Forest Plan as amended by INFISH	>20 pieces per mile

Indicator	Measure	Source	Standard
Pool Quantity	Pools per mile	RMO - Forest Plan as amended by INFISH	Pools per mile: See Table 54. Pools per mile by wetted width (INFISH, 1995)Table 54
Pool Quality	width to depth ratio	RMO - Forest Plan as amended by INFISH	W/D <10

Table 54. Pools per mile by wetted width (INFISH, 1995)

Wetted Width (Feet)	10	20	25	50	75	100	125	150	200
Pools per mile	96	56	47	26	23	18	14	12	9

1) ⊛ The existing conditions of high water temperatures not meeting INFISH standards in any of the years of available data; four major streams, including the N. Fork Crooked River, having water quality impairment from summer high water temperature, and most streams not meeting management objectives of 80% shaded surface or greater, all before in past sales, with bad results.

Existing Conditions in the Watershed

Water Quality—Stream Temperature

Within the project area there are four streams with assessed water quality impairments related to summer water temperature. These include North Fork Crooked River (7.8 miles), Fox Canyon Creek (5.2 miles), Roba Creek (3.6 miles), and Dry Paulina Creek (3.2 miles). These streams are on Oregon Department of Environmental Quality's (ODEQ) 2022 Section 303(d) List of "Water Quality Limited Waterbodies."

Observations from data collected from the early 1990s through present indicate that most of the streams within the project area are not meeting management objectives of 80% shaded surface or greater (Table 82, Appendix E). speak to the need not to log within RHCAs, which appears to have been done

Temperature data was summarized from the only long-term deployed data logger in the project area located in the lower North Fork Crooked River, downstream of the confluence with Deep Creek (the main cold-water input tributary). It is deployed high up in the project area. Due to a lack of data from other reaches and streams within the project area, these data were extrapolated to represent the whole project area. Figure 16 summarizes available data from 2005 to present. Water temperature has not met INFISH standards in any of the years of available data.

2) ⊛ There should be no commercial logging which would reducing shading (which would also reduce future large and mature wood recruitment into streams, reducing pool formation for cooler water refugia for fish) in RHCAs. the INFISH/PACFISH science behind the Eastside Screens RHCA buffers is still sound, and the RHCA original "no logging or heavy equipment" buffers should be retained.

condition for bank stability indicate both watersheds are meeting RMOs in terms of sediment and turbidity.

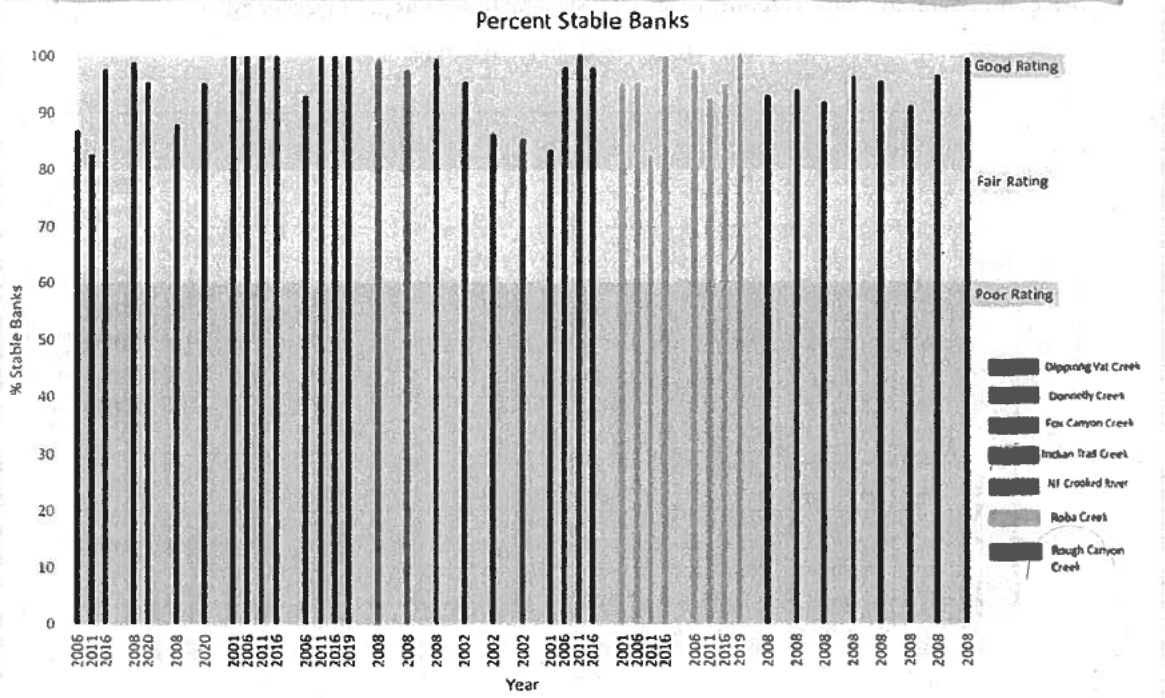

Figure 17. Percent Stable Banks for the project area. Data collected using R6 Level II and PIBO survey protocols. Bank Stability meets the 80% INFISH standard for RMOs in every year and stream reach in which bank stability data was collected.

Large Wood Recruitment

Available data shows that 68% (17/25) of sampled stream reaches in the project area are meeting the INFISH standard of 20 pieces per mile (Table 82 Appendix E, Figure 18). Research has indicated that current management objectives for pieces of large wood per mile (e.g., >20 pieces per mile) may be too low and in managed watersheds the target should be set higher for the interim until wood loading can occur within the natural range of variability (Fox and Bolton 2007, Wohl et al. 2017a, Wohl et al. 2017b). Based on supporting literature (Montgomery et al. 1995, Beechie and Sibley 1997, Seixas et al. 2020) and professional

(*) This updated science information re: current management objectives for pieces of wood per mile of streams may be too low and advising setting higher objectives for large wood recruitment until it is "within the natural range of variability" should be followed, including by not commercially logging and removing mature and large trees within RHCA buffers.

observations for the project area, the minimum desired large wood frequency per mile in most streams is 80 pieces minimum to enable reaching other INFISH RMOs such as pool frequency.

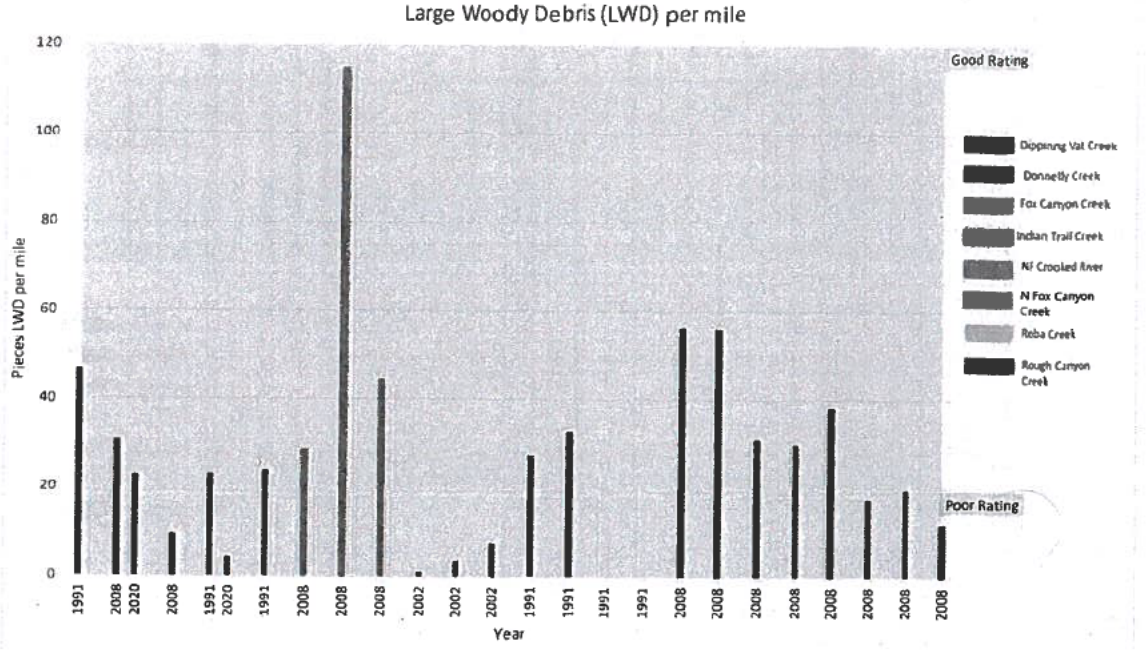

Figure 18. Large woody debris (LWD) per mile for the project area. Data collected using R6 Level II and PIBO survey protocols. The INFISH standard for RMOs of greater than 20 pieces per mile of LWD with a diameter at breast height greater than 12 inches is represented in the figure. ✱ With the majority of streams in the project area not meeting management objectives for pool quantity per mile, there should be no commercial logging in RHCAs.

Pool Quantity and Quality

The majority of streams within the project area fall well short of meeting management objectives of more than 96 pools per mile with no apparent trend in changing conditions (Table 82 Appendix E). Existing data show that only one reach in each of three streams within the project area meets or exceeds INFISH standards of more than 96 pools per mile: Dipping Vat Creek, Fox Canyon Creek and Roba Creek. North Fork Crooked River, with an average wetted width of 40 feet, meets INFISH standards. ✱ The overall decreasing trend of pool quantity in the project areas indicates the effects of logging & RHCAs & firewood cutting near roads & streams.

✱ Survey data indicates and overall decreasing trend of pool quantity in the project area. Only one stream, Dipping Vat Creek shows an improving trend in pools per mile.

Pool characteristics across the project area are generally shallow, exhibiting little habitat complexity. Average pool depth according to existing data is 0.78 feet. Survey data indicates that equal numbers of streams in the project area are improving, maintaining, and degrading in terms of pool depth, therefore no trends are apparent (Table 82 Appendix E). ✱ No large trees should be logged, as pool depth is increased by recruitment of large snags falling & large logs across streams and floodplains.

Watershed Condition Framework

The Forest Service defines watershed condition as the state of the physical and biological characteristics and processes within a watershed that affect the hydrologic and soil functions supporting aquatic ecosystems. Watershed condition reflects a range of variability from properly functioning to degraded (severely altered state or impaired). WCF is a broad-scale summary of many indicators of watershed health. A watershed can be rated as properly functioning and still have individual indicators that are not properly functioning. In general, the greater the departure from the functional state, the more impaired the watershed condition is likely to be. See Table 55 for a summary of watershed condition class in the project area.

Properly functioning, healthy watersheds have five important characteristics (Williams et al 1997):

⊛ We are concerned by so many findings of "poor" impaired conditions and "fair" at risk conditions in the Lower North Fork Crooked River Watershed for the N. Fork Crooked River & Upper Paulina and Dry Paulina Creeks. (See Table 55, p. 134)

Table 55. Condition Class Summary (USFS 2016)

	Lower North Fork Crooked River Watershed		Paulina Creek Watershed	
WCF Measurement Indicators	Fox Canyon-North Fork Crooked River	Rough Canyon Creek North Fork Crooked River	Upper Paulina Creek	Dry Paulina Creek
Water Quality	Poor	Good	Poor	Poor
Water Quantity	Fair	Good	Good	Good
Aquatic Habitat	Poor	Fair	Poor	Poor
Aquatic Biota	Good	Good	Good	Good
Riparian/Wetland Vegetation	Fair	Fair	Fair	Fair
Roads and Trails	Fair	Fair	Fair	Fair
Soils	Good	Fair	Good	Good
Fire Regime and Wildfire	Fair	Fair	Fair	Fair
Forest Cover	Good	Fair	Good	Good
Rangeland Vegetation	Good	Good	Fair	Poor
Terrestrial Invasives	Good	Good	Good	Good
Forest Health	Good	Good	Good	Good
Overall WCF Rating on USFS land	Functioning At Risk	Properly Functioning	Functioning At Risk	Functioning At Risk

'Good' equates to 'Functioning Properly', 'Fair' equates to 'Functioning at Risk', 'Poor' equates to 'Impaired'.

A 2005 assessment of the North Fork Crooked River found the lower section (from the confluence with Deep Creek down to the forest boundary) to be functioning at risk/ properly functioning with an improving trend (USDA Forest Service 2005). Subsequently, this section was closed from grazing in 2005. This improved condition is reflected in the properly functioning rating of the overall Rough Canyon Creek subwatershed.

Streams and Riparian Habitat Conservation Areas (RHCAs)

Inland Native Fish Strategy (INFISH) defines RHCAs as portions of watersheds where riparian-dependent resources receive primary emphasis and management activities are subject to specific standards and guidelines (USDA 1995a). Riparian Management Objectives (RMOs), which are to be considered at a landscape scale, contribute to optimum habitat for fish and serve as indicators of watershed health. RMOs provide a target toward which managers aim while conducting management activities and are expected to be maintained or improved upon over time.

Table 56. RHCA categories from INFISH

RHCA Category	Description	RHCA Width
Category 1	Perennial, fish-bearing stream	300 feet, each side of stream
Category 2	Perennial, non-fish bearing	150 feet, each side of stream
Category 3	Ponds, lakes, reservoirs, and wetlands > 1 acre	150 feet, from the edge
Category 4	Seasonally flowing or intermittent streams, and wetlands < 1 acre	50 feet, from the edge

⊛ These RHCAs make up about nine percent of the planning area (Figure 20 and Figure 21). Past land uses of historic livestock grazing and timber harvest practices, beaver trapping, road construction, and fire

suppression have reduced the functioning condition of RHCAs. These land uses also have increased erosional processes throughout the planning area (not just in RHCAs) above the natural range of variability.

"Because of past land-use practices and their impacts, peak stream flows during spring runoff are higher than they were historically. Consequently, stream channels have become more confined and incised, and streambanks are more scoured. Incised streams impede flood waters from reaching historic floodplains which leads to lowered water tables that then allow the increased proliferation of more xeric plant species, including conifers.[7] Conifers reduce water availability for deep-rooted riparian vegetation (willows, sedges, rushes) that are important to stabilize streambanks, trap sediment, and provide shade for cooler stream temperatures. [8] Many of the riparian areas lack large wood and deep-rooted vegetation and fail to provide quality habitat for aquatic species and sensitive species.[9] The over-dense conifers crowd out and take away water, nutrient, and sunlight resources from riparian and other vulnerable plant species, including Aspen and Peck's mariposa lily.

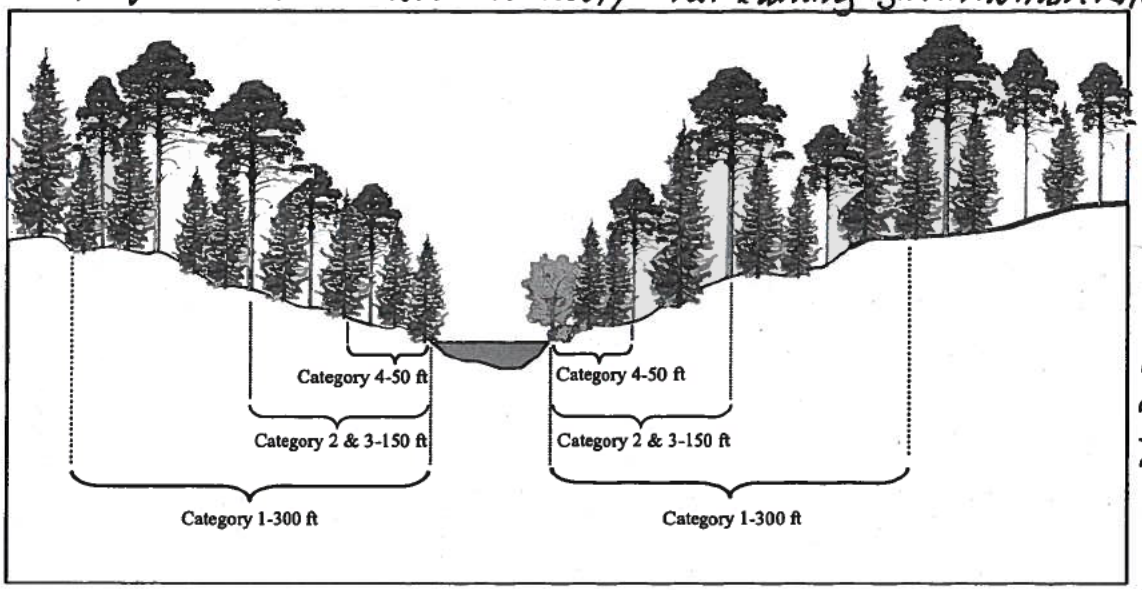

Figure 19. Representation of an untreated RHCA with substantial conifer encroachment (fuel loading), few riparian hardwoods, and a deficit of large woody debris in the stream channel.

Table 57. Hydrologic summary of RHCA categories and 303D listed streams in the project area broken down by watershed and subwatershed.

Hydrologic summary Watershed	Acres in Project Area	Percent of Total Watershed in Project Area	INFISH Category 1 RHCA (stream miles*)	INFISH Category 2 RHCA (Stream miles*)	INFISH Category 3 RHCA (Acres)	INFISH Category 4 RHCA (Streams miles*)	303D Listed Streams (miles)
North Fork Crooked River Watershed (10th field)							
Rough Canyon Creek Subwatershed	4,001.4	15.8%	2.0	0.0	0.0	9.2	0.0
Fox Canyon Creek Subwatershed	17,478.7	88.9%	14.0	0.0	185.1	42.9	13.0

The underlined part of the full 1st par. of p. 135 support our concerns regarding plans for more livestock grazing in RHCAs, commercial logging in RHCAs, road construction, wild fire suppression, & also beaver trapping, as these are all major causes of the existing condition. The text not underlined in par. 1 & supports our finding that non-commercial thinning and prescribed burning should be used in the NFCR project area RHCAs where needed, yet not burning ignition within RHCAs. We are strongly opposed to logging in RHCAs based on the science and evident impacts on the ground from past logging in RHCAs — including in the NFCR project area.

We are also very concerned by there being 13 miles of 303D-listed streams in the Fox Canyon Creek subwatershed and 6.8 miles of 303D-listed streams in the upper and Dry Paulina Creek subwatersheds in the NFCR project area.

The Forest Service is not allowed to further impair 303D-listed streams for their criterion or criteria for impairment. The Forest Service should not impose more commercial logging damage in RHCAs. (See EA Table 57, pp. 135-136.)

Desired Vegetation Conditions within RHCAs Needed to Attain Riparian Management Objectives

INFISH guidance directs us to apply silvicultural activities within RHCAs to acquire desired vegetation conditions where necessary for attaining RMOs. Reducing the density of conifers within the RHCAs would likely lead to an increase in large conifer growth and abundance of hardwood species that can reduce sediment transport and create additional pool habitat in the long-term via in-channel recruitment, providing refuge for fish and other aquatic species. Spies et al. (2013) recognizes that thinning is most beneficial in young stands and that noncommercial thinning can accelerate dead wood production. Also, windthrow following thinning can add more downed wood to RHCAs and stream channels. Benda et al. (2002) identifies windthrow as a significant contributor of large wood to streams. Reducing conifer density within RHCAs would also allow valuable riparian hardwoods to take hold, promoting streamside shade and therefore stream temperatures in the long term. Improving streamside hardwoods would also improve habitat for aquatic and terrestrial insects which are an important food source for aquatic species. See Forested Vegetation section for information on RHCAs at risk to insect and disease.

Climate Change Considerations

In the western United States, climatic trends and regional climate models suggest that not only will stream habitats become warmer, they will also become more variable in terms of their thermal and hydrologic regimes; more susceptible to stochastic disturbances such as flooding, wildfire, and drought; and more prone to invasion by nonnative species (Muhlfeld et al. 2015).

In the Climate Change Vulnerability and Adaptation (CCVA) in South-Central Oregon 2019, Halofsky et al. conducted a state-of-the-science climate change vulnerability assessment and developed adaptation options for national forests within the South-Central Oregon region. The CCVA shows that the effects of climate change on hydrology in south-central Oregon will be highly significant. Decreased snowpack and earlier snowmelt will shift the timing and magnitude of streamflow; peak flows will be higher, and summer low flows will be lower. Projected changes in climate and hydrology will have far-reaching effects on aquatic and terrestrial ecosystems, especially as frequency of extreme climate events (drought, low snowpack) and ecological disturbances (flooding, wildfire, insect outbreaks) increase. Proposed actions in RHCAs are taking into account these expected changes in hydrologic functions within the project area.

Distribution and abundance of cold-water fish species are expected to decrease in response to higher water temperature, although effects will vary as a function of local habitat and competition with nonnative fish. Higher air temperature, through its influence on soil moisture, is expected to cause gradual changes in the distribution and abundance of plant species, with drought-tolerant species becoming more dominant. Increased frequency and extent of wildfire and insect outbreaks will be the primary facilitator of vegetation change, in some cases leading to altered structure and function of ecosystems (e.g., more forest area in younger age classes). Vegetation change will alter wildlife habitat, with both positive and negative effects depending on animal species and ecosystem. Animal species with a narrow range of preferred habitats (e.g., sagebrush, riparian, old forest) will be the most vulnerable to large-scale species shifts and more disturbance. Thinning conifers in and adjacent to RHCAs would help to mitigate the effects of anticipated higher water temperatures, increased extent of wildfire, and continued degradation of aquatic habitat.

Water Resources and Infrastructure

- **Effects**: Decreasing snowpack and declining summer streamflows will alter timing and availability of water supply, affecting municipal and public uses downstream from public lands, as well as wildlife, recreation, firefighting, road maintenance, instream fishery flows, and livestock grazing. Lower low flows will affect water availability during late summer, the period of peak demand (e.g., for irrigation and power supply). Increased magnitude of peak streamflows in winter will potentially damage roads near perennial streams, ranging from minor erosion to complete loss of the road, thus affecting public safety, access for recreation and resource management, water quality, and aquatic habitat. Bridges, campgrounds, and facilities near streams and floodplains will be especially vulnerable, reducing access by the public.

• **Adaptation options**: Primary adaptation strategies for water use include improving water conservation, aligning water availability with demand, diversifying water sources, and reducing user expectations for water availability. Fuel treatments in low-elevation coniferous forest reduce the risk of high-severity fire and associated effects on soils, erosion, and water quality. Restoration techniques that maintain or modify biophysical properties of hydrological systems can increase climate change resilience. Reintroducing populations of American beaver helps to slow water movement and increase water storage. Primary adaptation strategies for infrastructure include increasing resilience of roads to floods, protecting roads and structures from landslides, reducing activities that increase landslides, increasing resilience of stream conditions to low flows at stream crossings, and increasing the resilience of recreation facilities and other developed sites. Tactics include increasing the size of drainage structures, reducing hydrologic connectivity of roads to the stream system, and decommissioning or rerouting vulnerable roads.

Fisheries and Aquatic Habitat

• **Effects**: Decreased summer stream flows and warmer water temperature will reduce habitat quality for coldwater fish species, especially at lower elevations. Based on projections of stream temperature in a warmer climate, optimal stream habitat for Redband trout, which currently have limited distribution and abundance, will decrease from 67 percent (current) to 40 percent (2080). Increased summer water temperatures and decreased summer flows are also expected to alter macroinvertebrate and mollusk populations in streams, lakes, and wetlands.

• **Adaptation options**: Primary adaptation strategies for fisheries and aquatic habitat focus on storing more water on the landscape, increasing resilience to disturbance, maintaining and restoring riparian and wetland vegetation complexity, and maintaining and restoring natural thermal conditions in streams. Specifically, managers can protect springs, increase shallow groundwater storage, increase soil water storage by maintaining or restoring riparian vegetation, and encourage beaver populations. Minimizing the impacts of roads and grazing may help offset increases in sediment yield, and increasing water conservation can help maintain summer flows. Implementing fuel treatments across the landscape may help reduce fire severity, in turn reducing erosion that degrades aquatic systems. Adaptation tactics will be most efficient if they are coordinated with existing stream management and restoration efforts conducted by the Forest Service, other agencies, and private landowners. ✱ commercial logging in RHCAs will not increase RHCA resilience, but degrade it, & will not move RHCAs toward meeting RMOs. Rej

Environmental Consequences

Table 58. Summary Comparison of Environmental Effects for Aquatic Resources

Resource Indicator	Analysis Measure	Alternative 1	Alternative 2	Alternative 3
Water Quantity and Quality	Water Temperature and Riparian Shade	No action would result in no change to the existing condition in the short-term and adverse long-term effects from lack of riparian hardwood shade and fire resiliency within RHCAs	Indirect beneficial effect in the long-term of improved hardwood shade and subsequent stream temperature moderation and will put the watersheds on a path of resiliency and achieving RMOs	Decreased short term effects to stream shade compared to Alternative 2 Would set RHCAs on a trajectory towards achieving historic conditions and RMOs and resilient RHCAs in the face of increases in stream temperature from climate change
	Water Yield/Peak Flow	No direct effects and no dramatic increase in water yield from	No direct or indirect effects to water yields in excess of Forest Plan	Direct and indirect effects to water yield are expected to be the

Resource Indicator	Analysis Measure	Alternative 1	Alternative 2	Alternative 3
		current management actions, yet no improvement in the stream network's ability to handle higher peak flows associated with predicted hydrologic conditions in a changing climate	standards. The nature of these actions would result in a recovery of water yield to existing conditions within 20 years Long-term effects include reduced competition to larger conifers within RHCAs which have large impacts on dissipating peak flow energy when recruited to the floodplain and stream channel	same for Alternatives 2 and 3
	Sediment Delivery	No adverse effects to sediment regime in the short-term	Adverse effects from increased sediment inputs in the short-term, but reduced sediment inputs in the long-term due to increased large wood on the floodplain and improved conditions for hardwood growth	It is possible there would be less adverse short-term direct effects to sediment regime from Alternative 3 compared to Alternative 2 due to no commercial harvest in RHCAs However, due to the application of BMPs and PDCs this difference is expected to be minimal Otherwise, the direct and indirect effects to sediment regime are expected to be identical between Alternatives 2 and 3
Large Woody Debris (LWD)	In-stream LWD Density and LWD recruitment potential	No measurable short-term (approximately a decade) increases in LWD in-stream and availability in RHCAs Inputs of large trees would decline as the development of large	Beneficial short-term effects to LWD in-stream and available in RHCAs Long-term effects to in-stream LWD and availability in RHCAs providing watershed	Direct and indirect effects would be similar to Alternative 2 in regards to hazardous fuels reduction, hardwood enhancement, and RHCA and instream LWD abundance

(*) Not if large trees are logged or there is mature tree logging in the RHCAs. See EA p. 141, 2nd par. under "Alternative 2."

Resource Indicator	Analysis Measure	Alternative 1	Alternative 2	Alternative 3
		replacement trees would be retarded by dense stand conditions The alternative would provide no improvement in watershed resiliency to the potential effects of climate change or other disturbance	resiliency for expected climate change	A decrease in activities within the RHCA would result in less disturbance and sediment delivery short-term relative to Alternative 2
Pool Quantity and Quality	Pools per mile and residual pool depth	No direct effects to aquatic biota and habitat from changes to pool quantity and quality would occur Indirect effects would include a lack of adequate pools per mile and pool depth	Beneficial short (5-8 years) and long-term (greater than 10) changes to pool frequency and quality, benefiting fish and other aquatic organism survival and condition	Direct and indirect effects to pool quantity and quality are expected to be the same for Alternatives 2 and 3

Indicator 1. Stream Temperature and Riparian Shade

Methodology

Water temperature has been accepted as a principal stream habitat variable that influences the chemical, biological, and physical processes within a stream channel (Coutant 1999, Caissie 2006, Isaak et al. 2010) and is extremely important to aquatic biota which often inhabit very narrow temperature ranges and many currently inhabit waters that are at or near their thermal limits (Coutant 1999, Gamperl et al. 2002, Crozier et al. 2008, and Penaluna et al. 2016). Reductions in solar input resulting from shading is a primary factor affecting stream temperature. The term "stream shade" refers to all shade on any part of the stream that blocks solar input to the stream channel. Functional stream shade generally occurs within 60 to 100 feet of the channel and can vary as a function of stream orientation, channel width, tree heights adjacent to the stream, and ground slope above the bankfull channel (Dewalle 2010). Emphasis is placed on stream shade from vegetation as it is one of the primary anthropogenic effects to stream temperature in unregulated (undammed) systems.

The temperatures in the INFISH Interim Riparian Management Objectives are based on bull trout presence or potential. Redband trout are the only salmonid currently present in the project area. More specific guidance for Redband trout streams exists in the Oregon state water quality standards. The Ochoco National Forest has incorporated into the LRMP via INFISH to not measurably increase the 7-day moving average daily maximum water temperature on any salmonid adult holding habitat or spawning or rearing habitats in the planning area (USDA Forest Service 1995). The state water quality standards more accurately reflect attainable conditions and target species (Redband trout) found in the project area. The state standards (340-041-0028, approved by EPA Mar 2004) identify the seven-day-average maximum temperature of streams listed as having salmon and trout rearing and migration should not exceed 18.0°C (64.4°F).

mitigate effects from livestock grazing by spreading browse pressure out over a larger and healthier population of hardwoods and stabilizing streambanks against hoof shear. For specific details on grazing management in the project area refer to range specialist report.

Alternative 3 (*) We support alt.3 non-commercially thinning in the RHCAs and not commercially logging RHCAs. The underlined comments under Alt.3 support our position.

This alternative would result in 1,107 acres of vegetation treatments within RHCAs, all of which would be non-commercial. Short-term adverse effects to riparian shade are possible from reduced conifer density in RHCAs. However, improved conditions for hardwood growth are expected to accelerate indirect long-term benefits to temperature. Relative to Alternative 1, Alternative 3 would support RMOs by providing the conditions necessary for healthy riparian hardwood recovery. Unlike Alternative 2, Alternative 3 would have no commercial harvest in RHCAs.

Direct and Indirect Effects

Alternative 3 has the potential for decreased short term effects to stream shade compared to Alternative 2. No commercial harvest would result in retaining all conifers >9" DBH within the 50ft PSZ. This would retain more stream shade in the short-term compared to Alternative 2. However, this does not necessarily equate to improved long-term condition for hardwood recovery and subsequent improved stream temperature moderation. It is widely accepted that streams within the project area were historically shaded primarily by riparian hardwoods, with low-density, mature conifer overstories. Opening overstocked stands and retaining mature conifers (>21" DBH) would set RHCAs on a trajectory towards achieving historic conditions and RMOs. A return to more natural riparian shading structure will create more resilient RHCAs in the face of increases in stream temperature from climate change. (*) Generally there are not enough mature trees or mature tree density in the RHCAs to interfere with riparian hardwood recovery.

Cumulative Effects

Cumulative effects for alternatives 2 and 3 are expected to be the same.

Indicator 2. Water Yield / Peak Flow

Methodology

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 (USDA Forest Service 1989) to determine the effects to peak flow from timber harvest activities and forest vegetative conditions. EHA is based on the principle that removing vegetation and the impacts of logging systems changes hydrologic response characteristics of the timing and magnitude of runoff, peak flow, snow accumulation, and total water yield. Excessive changes in these hydrologic response characteristics can lead to hillslope erosion, vertical and lateral scour of stream channels, channel degradation and/or aggradation resulting in poor water quality and affects to riparian condition. Refer to the Forest Plan for more details.

Each watershed on the Ochoco National Forest was evaluated for its susceptibility to disturbance and given a sensitivity rating of Low, Medium, or High in the Forest Plan. Sensitivity ratings were converted to an EHA threshold value (Table 3-34 of Forest Plan 3-80). The EHA threshold value represents the amount of a watershed that could be in an "Equivalent Harvest" condition (clear-cuts, partial cuts, burns, and other canopy or groundcover modifying treatments) before an adverse hydrologic response may occur in average or above average runoff years (e.g., 10-year or greater storm event). It should not be interpreted as a point above which detrimental impacts would occur. Watersheds that are more sensitive to disturbance, receive a

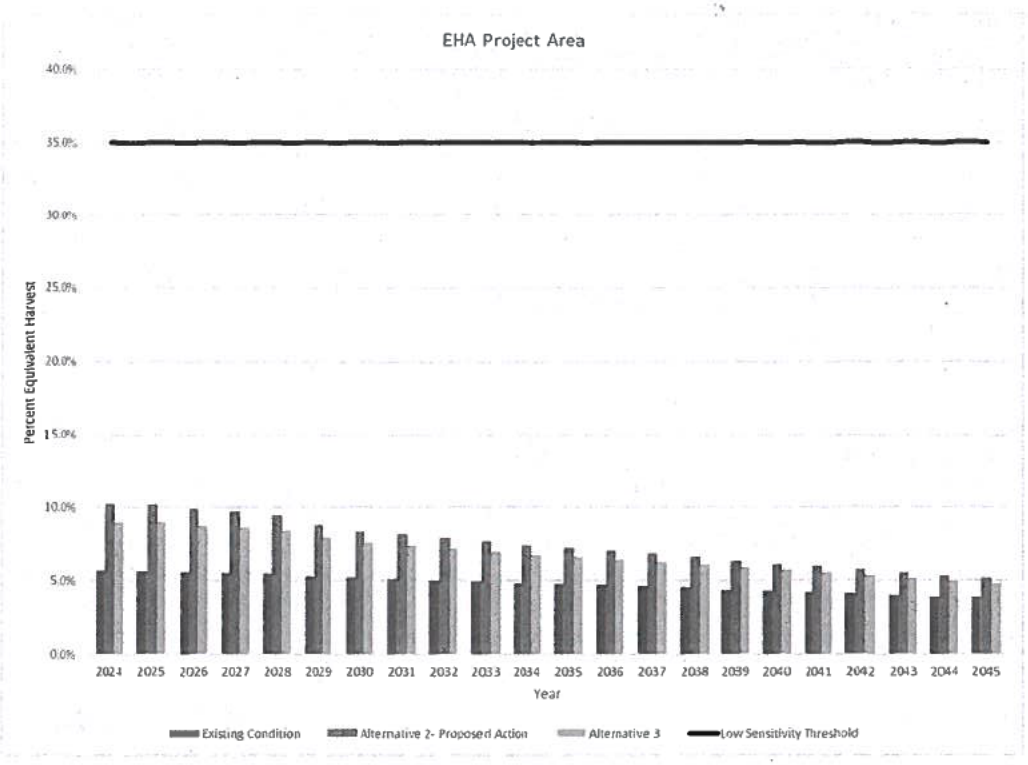

Figure 22. Equivalent Harvest Analysis for the project area. Includes all past management actions beginning in 1983 and all alternatives. All watersheds within the project area were identified as "low" severity, thus the percent acreage that can be in an equivalent harvest condition (clearcuts, partial clearcuts, and burns) before seeing a detrimental increase in peak flow is 35% (USDA Forest Service).

Alternative 2

Current conditions coupled with the proposed activities projected into the future show an initial increase in the EHA index value from 5.7% to 10.2% in 2024, with a steady recovery down to 7.4% in 2034 and 5.3% in 2044 (Figure 22).The EHA index will remain well below the 35% threshold for low sensitivity rated watersheds and reduce below existing conditions within 20 years. ⑯ When did the EHA limit get raised

Direct and Indirect Effects to a 35% threshold from an 11-15% threshold? This skews the analysis

EHA index projections (Figure 22 Figure 23 and Figure 24) indicate proposed vegetation management actions will not directly or indirectly affect watershed recovery, peak flow magnitude, and water yield in excess of Forest Plan standards. The nature of these actions will result in a recovery of equivalent harvest acreage to existing conditions within 20 years. to accept more Equivalent Harvest Area impacts. Who was responsible for this change, and why did the EHA threshold get increased?

has accumulated in the form of grand fir/white fir and Douglas fir in dry forests can reduce even low intensity surface fires that can increase soil erosion potential (Elliot et al. 2010).

Proposed changes in travel management would decrease the density of the road network in the project area. Roads are known to be primary contributors of sediment to streams. Decreasing road density will have a direct reduction in sediment transport into streams.

Cumulative Effects

The cumulative effects spatial boundary includes the two watersheds that are within the project area. The temporal boundaries for analyzing the cumulative effects are all recorded actions from 1999 through the reasonably foreseeable future. These include past and ongoing grazing management, past commercial and non-commercial vegetation management activities, and climate change. There are no other past or on-going activities that directly affect this resource indicator.

There is potential for negative cumulative effects to sediment regime from past and ongoing livestock grazing activities. The effects from no action would magnify the effects of livestock grazing where effects to streambank stability have occurred from browsing and streambank hoof shear. From a landscape scale, the effects to sediment regime from all action alternatives will not increase the effects from livestock grazing. On a local scale, there is potential for opening up overstocked portions of RHCAs and allowing easier access to cattle. Dropping whole trees on floodplains will act as slash fencing and reduce mobility for livestock to access the stream channel and trail along RHCAs. Long-term, robust populations of riparian hardwoods will mitigate effects from livestock grazing by spreading browse pressure out over a larger and healthier population of hardwoods and stabilizing streambanks against hoof shear. For specific details on grazing management in the project area refer to Range specialist report. Overall, cumulative adverse effects of grazing on streambank stability are not anticipated to increase.

Alternative 3

See Table 3 for total acreage of vegetation management actions in Alternative 3.

Road treatments will include closing and recontouring user-created/non-system roads along with system roads that have been identified as contributing to resource damage along with adjusted operational maintenance levels of other roads. Road treatments are identical in Alternatives 2 and 3.

Direct and Indirect Effects

(*) ↓ This EA analysis supports our concerns re: Commercial logging in RHCAs, as in alt. 2, would increase excess fine sediment in streams.

(*) It is possible there would be less adverse short-term direct effects to sediment regime from Alternative 3 compared to Alternative 2 due to no commercial harvest in RHCAs. However, due to the application of BMPs and PDCs this difference is expected to be minimal. Otherwise, the direct and indirect effects to sediment regime are expected to be identical between Alternatives 2 and 3.

Cumulative Effects

Cumulative effects for alternatives 2 and 3 are expected to be the same.

Indicator 4. Large Woody Debris Recruitment

Methodology

The importance of large wood (i.e., trees) and its control on stream channel morphology, sediment and organic matter storage and routing, and its role in the creation of fish habitat has been well established (Bjorn and Reiser 1991, Roni et al. 2014, Wohl et al. 2017a, Wohl et al. 2017b, Wohl et al. 2019). Past management actions such as the removal of large wood from streams, channelization, and road building within the riparian corridor have had negative impacts on the stream network within the project area. The net effect of direct and indirect LWD and beaver removal from river corridors has increased channel conveyance for water and sediment and decreased the physical complexity of channels and floodplains

(*) This analysis underlined supports our concerns.

Environmental Consequences

The spatial boundaries for analyzing the direct, indirect, and cumulative effects to wild and scenic rivers is the North Fook Crooked Wild and Scenic River Scenic Corridor (MA-F24) on the Ochoco National Forest because this is the geographic area within which ORVs are identified and within which the management direction of the Wild and Scenic River Plan applies.

Direct and Indirect Effects ⊛ We support alt. 1 & alt. 3 no "treatment units" in the Wild & Scenic River corridor.

Alternative 1 and 3

No proposed activities would occur with selection of Alternative 1 and treatment units have been withdrawn from Alternative 3; therefore, in both Alternatives, no direct or indirect effects on the scenic or botanical values determined to meet the criteria as an ORV in Segments 3 and 4 of the North Fork Crooked Wild and Scenic River would occur. ⊛ We strongly disagree that commercial logging in the Wild & Scenic River corridor "would have no effect on scenic values."

Alternative 2

Noncommercial hardwood enhancement is proposed to enhance and restore aspen where they are located within treatment units. This treatment would reduce conifer competition by cutting down and/or girdling conifers that have encroached into the aspen communities and installing fencing and individual cages where needed to prevent browsing. This treatment would have a beneficial effect on the scenic values because it would improve and enhance aspen communities that contribute to the scenic ORV. The botanical and silviculture treatment described in the EA would have no effect on the botanical values because it would not include old growth ponderosa pine and there are no known populations of sensitive species in these units.

Commercial thinning, large wood source removal, and fuels reduction proposed in Segment 3 and 4 of the North Fork Crooked Wild and Scenic River Corridor would have no effect on the scenic values determined to meet the criteria as an ORV because these treatments would not occur in the areas that represent the scenic values (e.g. old growth ponderosa pine, ribbon of riparian vegetation along the river, open grassy meadows seasonally filled with wildflowers, the rippling river). Units proposed inside the Wild and Scenic River corridor for commercial thinning, large wood source removal, and prescribed burning are 300 feet or more from the river and are largely or entirely not visible from the river point of view due to topography, e.g. steep slopes or slope breaks, and vegetative screening. ⊛ We are opposed to commercial logging and large wood removal from the Wild + Scenic River corridor.

Commercial thinning, large wood source removal, and prescribed burning proposed in Segment 3 and 4 of the North Fork Crooked Wild and Scenic River Corridor would have no effect on the botanical values determined to meet the criteria as an ORV as these activities would not include the cutting of old growth ponderosa or in locations where sensitive plants species occur. Furthermore, thinning effects are short term less than five years. Any thinning of smaller trees amongst large ponderosa pine will reduce competition and enhance visual opportunities for these large pines. Noise, smoke and slash are short term effects that are relatively not apparent to the common visitor after five years of treatment. ⊛ Drop all commercial logging in the Wild & Scenic River corridor.

Alternative 2 has a total treatment of 520.92 acres and Alternative 3 with 512.53. Both Alternatives are very similar with only 8.39 acres difference between them. Within the Wild and Scenic River corridor Alternative 2 there is a total of commercial treatment of approximately 198 acres, noncommercial thinning of 244 acres, and under burn-only of 78 acres. Of this there are 99 acres of commercial treatment (HTH) in Late Old Structure (LOS). No Old Growth ponderosa pine regardless by characteristics or tree diameter will be cut inside the Wild and Scenic River corridor in either Alternative 2 or 3.

Cumulative Effects

Alternatives 1, 2, and 3

No direct or indirect effects on the scenic or botanical values determined to meet the criteria as an ORV in Segments 3 and 4 of the North Fork Crooked Wild and Scenic River would occur; therefore, there would be no cumulative effect.

2) ⊛ The adjacent forest is part of the setting for the Wild & Scenic River corridor. Recreationists favor intact, natural old growth forest, not signs of recent logging. Commercial logging of the area would deter most people from recreating there again. Visitors would expect natural forest surroundings for hiking, camping, wildlife viewing, Nature photography, scenic views, and an escape from the industrialized cities. Recreationists should not be confined to 300 feet from the river for a natural and scenic experience.

⊛ We disagree that undeveloped lands < 1,000 acres should not be identified and considered for protection from management impacts - especially from commercial logging and roads.

Undeveloped Lands

This project does not involve any Wilderness areas or Inventoried Roadless Areas; therefore, there will be no effect to either of these types of land designations and they will not be discussed further.

Undeveloped lands are isolated polygons of Forest Service land that are generally free of developments (roads, trails, and past harvest activity) and minimum of 1,000 acres in size. Undeveloped lands are not wilderness or inventoried roadless areas but may have special resource values due to their undeveloped character.

Undeveloped lands are not a land designation and they do not imply or impart any particular level of management direction or protection. Undeveloped lands are not identified in the Ochoco Forest Plan and there are no standards or guidelines specific to these areas. Undeveloped lands are managed consistent with forest-wide and management area standards and guidelines designated by the Ochoco Forest Plan.

The analysis process for undeveloped lands was conducted through a sequence of Geographical Information System (GIS) analyses, review of aerial photos and satellite imagery, review of field data and local knowledge, and application of professional judgement. The judgement applied was situational and instance by instance. Data sources consulted for this analysis include NAIP imagery, LiDAR Hillshade and DEMs, and Forest Service GIS Layers.

The NFCR project area and an adjacent two miles beyond the project boundary were used for the analysis boundary. Areas qualify as undeveloped lands for this project if, when evaluated, the areas meet the following criteria:

- the area is free of substantially noticeable activities, including past harvest activity or other developments;
- the area is free of roads;
- the area contains 1,000 acres or more;
- the area is configured in a manner that is characteristic of undeveloped lands.

The analysis process described in the Methodology above resulted in the identification of 7 polygons ranging in size from 1,187 acres to 4,436 acres that meets the criteria for undeveloped lands in the NFCR project area (Figure 26). These polygons primarily fall in the scab areas of the scab-stringer landscape. Forest Plan management areas included in these polygons are General Forest, General Forest Winter Range, Winter Range, and Wild and Scenic River Corridor. Portions of the polygons lie outside of the National Forest boundary on lands managed by the Bureau of Land Management (Figure 26).

Environmental Consequences

There is no forest, regional, or national direction or guidance for evaluating undeveloped lands. Undeveloped lands are managed consistent with forest-wide and management area standards and guidelines designated by the Ochoco Forest Plan as amended.

The spatial boundaries for analyzing effects to undeveloped lands are the NFCR project area and an adjacent two miles beyond the project boundary inside National Forest System lands. Undeveloped lands beyond the project boundary were only included if they were connected to lands inside the boundary. This analysis tiers to the analysis in the FEIS for the Ochoco LRMP (USDA Forest Service 1989a). The FEIS disclosed that active management of forest stands would continue throughout the planning timeframe and would affect environmental components.

Alternative 1

No proposed activities would occur with selection of Alternative 1; therefore, the lands in the undeveloped polygons would remain undeveloped and unroaded.

Alternatives 2 and 3

Alternatives 2 and 3 include proposed activities in the undeveloped polygons, as illustrated in Table 81. In addition, temporary roads may be used in these areas in order to access treatment units. Implementation of Alternative 2 or 3 would reduce the size of undeveloped polygons depending on how much is affected. As shown on Figure 26, the majority of the undeveloped polygons are not affected as they are located on scab portion of the scab-stringer landscape. Polygons 3 and 5 are not affected by project activities; and polygons 2, 4, and 6 are only minimally impacted around the edges. ④ Drop all commercial logging planned for undeveloped lands – the 665 acres under alt. 2 and the 465 acres under alt. 3

Table 81: Proposed activities in undeveloped polygon by alternative

Proposed Activity	Alternative 2 Acres	Alternative 3 Acres
Commercial Thinning (ground)[1]	665	465
Noncommercial Thinning[2]	843	1,060
Prescribed Burning[3]	111	104
Total	1,654	1,629

1: Noncommercial thinning and prescribed burning would occur in all commercial thinning and biomass units.
2: Noncommercial thinning and prescribed burning only.
3: Prescribed burning only.

⑤ The Ochoco Forest Plan, like others in the region, is severely outdated, including its failure to recognize the alteration and degradation of forest ecosystems from past and ongoing management – especially from commercial logging, road building and re-opening, and overgrazing by livestock. The Forest Service is not required to manage every acre of National Forest lands. Undeveloped lands provide most of the best wildlife habitat, including refugia from human disturbance and more intact ecosystem processes and functions. Undeveloped lands are also critical to human mental health and well-being, offering solitude, quiet, direct connection with the land and wild animals and plants. Undeveloped lands also can preserve water quality, reference conditions as a baseline comparison for adaptive management, and wild natural conditions for scientific study and solace in a rapidly changing world.