CENTRAL OREGON LANDWATCH

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December 1, 2023

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Re: Draft Environmental Assessment for the North Fork Crooked River Forest Resilience Project

Thank you for the opportunity to comment on the Draft Environmental Assessment ("EA") for the North Fork Crooked River Forest Resilience Project posted in the Bend Bulletin and at Ochoco National Forest & Crooked River National Grassland - Home (usda.gov) on November 1, 2023.

Central Oregon LandWatch ("LandWatch") is a conservation organization which has advocated for preservation of natural resources in Central Oregon for over 30 years. With over 750 members in Central Oregon, LandWatch has a long history of protecting the forests and streams in and around the Ochoco National Forest and the Paulina Ranger District. LandWatch's members and supporters live in Central Oregon, including on lands adjoining the Ochoco National Forest, and recreate in the Paulina Ranger District. They hunt, fish, take photographs, view wildlife, hike, drive, and engage in other recreational activities in the District, generally, and in the North Fork Crooked River Project area specifically.

LandWatch appreciates the time, effort and resources put forth by the Ochoco National Forest in developing the North Fork Crooked River Forest Resilience Project ("Project"). LandWatch shares many of the Forest Service's concerns related to improving resiliency in the face of climate change; improving the management of, and restoring Riparian Habitat Conservation Areas to attain Riparian Management Objectives; and in improving habitat for big game and other wildlife in the project area. However, we have several concerns with the project as proposed, which are detailed in the following comment. LandWatch also strongly recommends the Forest Service develop a more comprehensive approach to restoration, with site-specific plans that address the widespread degradation described in the EA, especially within riparian areas. This must include actions that address the ultimate drivers of habitat degradation, setting the Project area on a trajectory that will restore key ecological functions and processes, improve resiliency in the face of climate change, and successfully meet the many standards and guidelines that are failing due to current management.

I. An EIS is Required

This project requires an EIS based on the scale of project and the proposed treatments.

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An EA is used to "determine the significance of the environmental effects and to look at alternative means to achieve the agency's objectives," and is intended as a brief, faster route than an Environmental Impact Statement ("EIS") when an agency believes there will be minimum environmental impacts.[1] An EIS, on the other hand, is necessary when it becomes clear to an agency that the project will have significant environmental effects—the Draft EA makes these significant environmental effects clear.[2] Here, the widespread treatments over more than 37,000 acres, including within RHCAs, LOS and connectivity corridors, and with impacts to an expansive host of species, including but not limited to Redband trout, elk, and a declining mule deer population, rises to the level of significance that requires an EIS.

Further, this Project is very similar to the Black Mountain Vegetation Management Project ("Black Mountain"), which conducted an EIS.[3] Considering the North Fork Crooked River Project is larger than Black Mountain, substantially similar in the proposed actions, and adjacent to the Black Mountain project on the Ochoco National Forest, it is arbitrary and capricious for the Forest Service to decide here to do an EA and not an EIS.

As such, the Paulina Ranger District must conduct an EIS, not an EA, for the North Fork Crooked River Project.

II. Purpose and Need

The Draft EA states that the purpose and need for the project is 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 management objectives; to promote adaptation to climate change; and a need to improve habitat security for big game" (EA at 3). As described in the EA, the Project is largely focused on conducting timber harvest to achieve the purpose and need, and to restore multiple habitat types and ecological processes within the project area. As discussed throughout this comment, this approach will largely fail to meet the purpose and need for the project. In other words, the EA fails to articulate a rational connection between the facts found and the conclusion made.[4]

For example, the Draft EA concedes that the Project's riparian areas have been heavily degraded by past forest management decisions and practices (See EA at 128, 135, 157, 159). Yet, the FS still proposes extensive logging, including commercial logging under Alternative 2, in these critically important but largely degraded habitats. As we discuss further in this comment, the proposed logging will negatively impact already degraded streams, directly in opposition to the stated purpose and need of creating conditions needed to attain Riparian Management Objectives ("RMOs"). Further, the proposed project fails to address many of the past activities described in

[1] *A Citizen's Guide to NEPA, Having Your Voice Heard,* Council on Environmental Quality, Executive Office of the President, January 2021; 40 CFR 1508.9 (Jan. 3, 2017); 40 CFR 1508.11 (Jan. 3, 2017)
[2] *Id.*
[3] Black Mountain Vegetation Management Project (2019), Paulina Ranger District, Ochoco National Forest, USFS USDA
[4] *Mtr. Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (The agency must "articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made.")

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the EA as causing degradation, including livestock grazing and an extensive road network (See further discussion in the Riparian Habitat Conservation Area and Travel Management sections of this comment).

While some actions to restore large woody debris and establish more pools in streams within the project area are discussed—outcomes LandWatch supports—the restoration actions proposed are to cut trees in support of riparian area health. While removal of some conifers in specific locations, in conjunction with other actions may assist in restoration efforts, the simplified approach outlined to "restore" riparian areas falls far short of what the Forest Service's responsibilities are under Inland Native Fish Strategy ("INFISH") and the Ochoco Forest Plan. For example, the Forest Service should consider additional strategies to reconnect streams to their floodplains, restore hardwood plant communities through native plantings and enclosures, and improve bank stability, water quality, and plant community resilience. Importantly, this work cannot be developed and implemented in a vacuum; livestock grazing must be addressed in tandem, excluding cattle where restoration actions are implemented. Additionally, further road closures and decommissioning is required to truly restore and rehabilitate riparian areas, as well as other key wildlife habitats within the project area.

If the project focused on a more inclusive and holistic approach to restoring riparian areas, the Forest Service could much more effectively improve resilience to disturbance events, meet RMOs, adapt to climate change, and improve habitat security for big game across the project area (See additional discussion on this topic in the Riparian Habitat Conservation Area section of this comment). Unfortunately, the project as proposed will not achieve these goals, and therefore will fail to meet the stated purpose and need.

Further, given the EA's description of the high degree of overlap between big game security habitat and riparian areas, in order for the Forest Service to meet this part of the purpose and need, much more emphasis should be placed on comprehensive restoration strategies, in addition to closing and decommissioning more roads to provide meaningful security habitat.

In an EIS, the Forest Service must propose actions that more closely relate to the stated purpose and need. As proposed, the project will further impact Riparian Habitat Conservation Areas ("RHCAs") and retard attainment of RMOs, fail to adequately address key management factors related to adapting to a changing climate (e.g. livestock grazing and road network), and further impact habitat for big game across the project area.

III. Inadequate Range of Project Alternatives

The Project failed to evaluate a reasonable range of alternatives. NEPA requires the agency's environmental analysis documents to "[r]igorously explore and objectively evaluate all reasonable alternatives" to the Project.[5] The agency failed in excluding an alternative that

[5] 40 C.F.R. § 1502.14(a); Please be explicit about which version of the CEQ's NEPA regulations are being applied. We request that you apply the spirit, if not the letter, of the 1979 version of the regulations, given the legal and regulatory uncertainty surrounding the 2020 version

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incorporates greater protections for wildlife and riparian habitats, and meaningful landscape scale closure and decommissioning of roads.

Viable alternatives are alternatives that are feasible, meet the stated goals of the project, or are reasonably related to the purposes of the project.[6] The range of alternatives must also intend to find a Project alternative "that might enhance environmental quality or avoid some or all of the adverse environmental effects."[7] The Project lacks a reasonable range when there is the "existence of a viable and unexamined alternative," or when two action alternatives are deemed nearly identical.[8]

The EA makes clear that the two action alternatives are identical related to closing and decommission roads (See EA at 168, "There is no difference in maintenance level changes between alternatives 2 and 3."). Further, in the wake of *Greater Hells Canyon et al. v. Wilkes et al.* (2023), the range of alternatives should be re-analyzed as key aspects related to the logging of large trees in Alternatives 2 are no longer viable.[9]

In addition, feasible work related to the restoration of degraded riparian areas was not explored; instead, the Forest Service proposes timber harvest and prescribed burning as the primary actions for a riparian restoration strategy.

LandWatch recommends that the Forest Service consider in detail an alternative with the following provisions:

- No commercial logging in Riparian Habitat Conservation Areas
- A robust riparian restoration plan for explicitly identified areas within RHCAs (See RHCA section of this comment for additional details)
- Removal of livestock from all areas where treatments and restoration actions are proposed
- Cage and fence recovering riparian areas to exclude livestock
- Retain all trees ≥21" DBH in the project area
- Substantially decrease the number of roads open to motorized vehicles, including administrative access roads
- Decommission more roads to reduce impacts to streams and wildlife habitat, especially within RHCAs and identified special elk habitats
- Establish the project area road density based on all roads physically open to motorized vehicles, regardless of maintenance level

[6] *Native Ecosystems Council v. U.S. Forest Service*, 428 F.3d 1233, 1246-47; See *W. Watersheds Project v. Abbey,* 719 F.3d at 1052 ("Feasible alternatives should be considered in detail.")
[7] 40 C.F.R. § 1500.8(a)(4).
[8] *Western Watersheds Project v. Abbey,* 719 F.3d 1035, 1050 (9th Cir. 2013); *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 813-14 (9th Cir. 1999).
[9] *Greater Hells Canyon et al. v. Wilkes et al.*, U.S. District Court for the District of Oregon, case No. 2:22-cv-00859 (Findings and Recommendations, August 31, 2023)

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- Identify funding, develop explicit timelines, and create a monitoring plan for all proposed road closures and decommissioning
- Identify explicit leave patches, including details about their size and location on the landscape, based on key needs of focal wildlife within the project area
- Provide more measurable Resource Protection Measures to protect and facilitate habitat connectivity for wildlife within the project area, including within commercial and non-commercial thinning units
- Protect intact and functioning riparian areas from impacts related to livestock grazing, road development, and timber harvest practices
- Develop site-specific prescribed burn plans
- Take actions and coordinate with cooperating agencies to facilitate the reintroduction of beaver
- Conduct pre and post project monitoring of RMOs and other ecological indicators
- Adequately account for impacts on carbon release and climate change
- Do not conduct commercial or ground based mechanized treatments within Wild and Scenic River Corridors
- Do not rely on HRV to develop management targets and prescriptions

The proposed alternative we describe above represents an unexamined alternative; it is an ecologically sound option that avoids adverse environmental effects, upholds the Forest Service's other duties to protect wildlife and aquatic habitat, and supports the Project's purpose and need to create conditions needed to attain RMOs, improve big game security habitat, and promote adaptation to climate change. The Draft EA, however, does not include any combination of these actions and the analysis does not adequately describe how or why the purpose and need cannot be met if an alternative like LandWatch's is incorporated.

The Draft EA is inadequate without analyzing viable unexamined alternatives, and intensely considering a more ecologically sound course of action.[10] In an EIS, the Forest Service should include and analyze LandWatch's proposed alternative, which encourages more protection and restoration of wildlife and riparian habitat, removes all commercial logging in RHCAs, retains all large diameter trees, and more effectively addresses the Project's dense road system.

IV. Incomplete and Inaccurate Baseline Data

Information essential to facilitating meaningful public review and ensuring an informed agency decision is missing from the Draft EA. This includes information on: the Historic Range of Variability ("HRV") necessary to understanding past conditions and project justification for the proposed actions; key ecological information related to wildlife and their habitat, including special elk habitats, such as rutting, wallowing and calving; key data on baseline conditions in

[10] *Alaska Wilderness Recreation & Tourism v. Morrison*, 67 F.3d 723, 729 (9th Cir.1995); *Environmental Defense Fund v. Corps of Engineers*, 492 F.2d 1123, 1135 (5th Cir. 1974); *Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810 (9th Cir. 1987), rev'd on other grounds, 490 U.S. 332 (1989) (agency must consider alternative sites for a project).

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RHCAs; an accurate accounting of physically open roads experiencing motorized use within the project area; and discussion of significant new published and relevant scientific papers and reports.

a. Historic Range of Variability

LandWatch is concerned that the HRV data used to justify the amount and location of treatments and the logging of trees 21" DBH and over is based on inadequate baseline information. Under NFMA, the Forest Service must utilize the best available science, explain the conclusions it has drawn from its chosen methodology, and the reasons it considers the underlying evidence to be reliable.[11] Under NEPA, the Forest Service must maintain the professional and scientific integrity of discussions and analyses, which includes ensuring the inclusion and use of accurate scientific information and a duty to address scientific controversy.[12] Recent literature highlights ongoing concerns about the baseline model for HRV used in the Draft EA, calling into question whether the Project has incorporated the best available science, addressed scientific controversies around the HRV model used, as well as the validity of using HRV to inform management projects in general.

For example, Baker et al. (2023), asserts that the predominantly used model for HRV, which supports a low severity fire model, is based on outdated assumptions, omits critical data, and is not supported by the majority of current research. The omitted scientific data suggests a more accurate model for HRV in Western US dry forests is a mid-severity model. This means that instead of operating on the assumption that "dry forests were relatively uniform, low in tree density, and dominated by low- to moderate-severity fires," which are the assumptions under the "low severity" model, the Project should actually use the "mixed-severity" model, which assumes that "dry forests were heterogeneous, with both low and high tree densities and a mixture of fire severities" (Baker et al. 2023). This study extends its analysis to the impacts of using an incorrect HRV model to justify forest management decisions, finding:

> The four studies with adequate samples… showed that recent fire rotations were within or longer (413, 608, 695, 875, 1045, and 1693 years) than the historical range of 217–849 years documented by Baker, based on land-survey reconstructions, paleo-charcoal studies, and reconstructions from early aerial photographs…. This evidence shows that there is no ecological need to reduce high-severity fire through fuel reduction; doing so successfully would likely have effects similar to fire suppression, which is widely understood to have deleterious ecological effects.

LandWatch asks if the Draft EA's model for HRV incorporates the most up to date science, including the omitted data in Baker et al.'s analysis on HRV models to use in dry, Western forests.

[11] 36 C.F.R. § 219.3; *Earth Island Inst. v. Carlton*, 626 F.3d 462, 470 (9th Cir. 2010).
[12] 40 C.F.R. § 1502.24, 40 C.F.R. § 1500.1(b), 40 C.F.R. §§ 1502.9(b), 1502.12.

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The Project appears to be using the low severity HRV model, which is rooted in incomplete data, and at the very least, the difference in models for HRV is a scientific controversy that should be addressed and explained. The updated methodologies described in Baker et al. (2023) should be addressed by the Forest Service in an EIS, in addition to the ample research cited that supports frequent fire, old growth, mixed conifer forests as the historic make-up of dry eastside forests of the West. The impacts of an incomplete model for HRV have significant consequences for the design and analysis of the Project, as estimations for logging to restore HRV and account for fire behavior would all be overstated in the analysis (See EA at 34, "Fire regimes are a key component of historical range of variability (HRV) characterizations for forest and vegetation types").

Related, no information is provided about the process the Forest Service used for establishing key metrics of the HRV analysis. For example, no information is provided detailing how the Forest Service established their definition of Late Old Structure (LOS) stands by PAG, and what data or information was used to calculate the minimum number of large trees per acre needed for an area to quality as LOS (e.g. LOS in the Dry Grand Fir PAG is defined as having a minimum of 15 large trees per acre). Related, the EA goes on to describe structural classes, including "high density" LOS and "low density" LOS (See table 6, EA at 19), however no explicit thresholds are provided for determining whether an LOS stand is high density or low density, or what data was used to establish high and low density LOS metrics. Given the EA's HRV analysis for each PAG (see EA Figures 4-9) centers on the definition of these structure classes, and the justification for logging within LOS as proposed under alternative 2 is based in part on structure class M5a (high density LOS) being above HRV, its critically important that the data used to establish these structure classes, and principally, how the Forest Service determined appropriate thresholds between high and low density LOS, be made publicly available. Without that information, it's impossible to understand whether the agency is conducting an informed decision-making process or acting arbitrarily.

Further, the Project uses HRV to re-establish the historic range of tree species, tree density, and forest structure, but not to re-establish other forest conditions like overall biodiversity, road densities, grazing intensity and location, floodplain connectivity, herbaceous vegetation, riparian area function, sediment transport, soils, predator-prey dynamics, etc. If HRV is to be used to return forests to their historic conditions, the history cannot be viewed so narrowly as just looking at tree density, species, and structure; other key metrics of the forest condition—such as those listed above—must also be restored to historic ranges if this is the preferred model and strategy for designing forest management projects.

For example, the EA states that "[t]hese land uses [referring to logging, grazing, road construction, etc] also have increased erosional processes throughout the planning area (not just in RHCAs) above the natural range of variability" EA at 135. And "[g]razing and fire suppression have altered the species composition and tree density of upland forests, resulting in increased density of fire intolerant conifers such as grand fir and Douglas-fir and reduced the density of understory vegetation (Arno, 2000)" (EA at 101). The EA clearly states that livestock grazing, logging, and road development have been drivers behind changes to the landscape from what the Forest Service estimates the HRV for the project area to be. Yet, no action is taken to

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meaningfully address the full suite of these land uses to restore the landscape back to the Forest Service's defined HRV. Further, the EA fails to establish HRV metrics for soils, biodiveisty and species composition beyond tree species, density, and structure.

Additionally, research from the USDA Forest Service, Pacific Southwest Research Station, supports that HRV is an inappropriate tool for developing management targets and prescriptions, especially in regard to "ecosystem Management" approaches, and when present and future projected climates are different than the historic climate (Millar 2014). LandWatch therefore questions the utility of designing a project with significant logging, intended to reduce stands to modeled HRV conditions, when climate change is having, and is projected to have profound impacts on landscapes in the project. As it relates, we are concerned the Draft EA has not met its legal duty under NEPA to adequately consider the Project's climate impacts, and, conversely, the effects of climate change on the Project area.[13]

In an EIS, the Forest Service should use an HRV model that reflects dry forests that were heterogeneous, with both low and high tree densities and a mixture of fire severities. Further, HRV should not so strictly determine how the Project is designed, as we need to let forests evolve and adapt to our future climate, not "restore" them to a past structure, represented by a climate regime that no longer exists. Instead, the Project should focus on actual ecological restoration that benefits wildlife and aquatic processes. Lastly, the Forest Service must provide the data used to develop LOS tree densities for each PAG, and thresholds between structure classes within LOS.

b. Riparian Habitat Conservation Areas

The EA makes clear that improving conditions in RHCAs is a key part of the purpose and need for the project (EA at 127). Yet, as discussed further in the RHCA section of this comment, the Forest Service has made almost no effort to collect key data and establish an accurate baseline of the current condition of these critically important features within the project area.

Appendix E of the Draft EA shows the stream survey data the FS has collected within the project area. Only 4 stream reaches out of the 48 that have been surveyed in the past 30 years were surveyed in the past 3-5 years, which the Forest Service describes as the data that best reflects current management (See EA at 137). And of those four reaches, most of the RMOs were found to be failing or had no data available (See Table 1 below). The minimal data on stream condition within the project area fails to satisfy both NEPAs hard look and accurate environmental baseline standards.

[13] 88 FR 1196, CEQ "National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change," https://www.federalregister.gov/documents/2023/01/09/2023-00158/national-environmental-policy-act-guidance-on-consideration-of-greenhouse-gas-emissions-and-climate

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Location	Protocol	Year	Dry Channel (%)	Wetted Width (ft)	Pools / Mile	Avg Residual Pool Depth (ft)	Stable Banks (%)	Fine Sediments (%)	LWD/ Mile (>12 in)	Hardwood Shade (%)	Total Shade (%)	W/D Ratio	Entrenchment Ratio
Roba Creek 1041	PIBO	2019	---	---	252.7	0.3	100	27.4	---	---	---	11.4	---
Fox Canyon Creek 2058	PIBO	2019	---	---	111.4	0.6	100	8.7	---	---	---	30	---
Fox Canyon Creek R1	R6	2020	81.1	4	16.2	1.1	95.2	2.3	4.4	36.7	65.8	29.9	1.6
Donnelly Creek R1	R6	2020	99.8	0.13	0.6	0.5	95.4	19.4	22.9	12.6	73.4	---	---

Table 1. Relevant available data from Region 6 Level II surveys and PACFISH/INFISH Biological Opinion (PIBO) Monitoring completed in the past 5 years. Green = RMOS are being met, red = RMOs not being met, dashed line = no data available.

Given the outsized importance of riparian areas to wildlife and ecological processes in the project area, and the requirements under NEPA to establish an accurate environmental baseline, it is critically important that the Forest Service collect the necessary baseline data on riparian areas within the project area. This should include data related to INFISH RMOs, DEQ temperature standards, and necessary data on entrenchment, hardwood shade, and other ecological indicators that are incomplete or missing from Appendix E.

c. Special Elk Habitat

The EA states clearly that part of the purpose and need for the project is to improve habitat security for big game. Yet, like RHCAs, the Forest Service has not collected important data required to establish an accurate baseline on current conditions for special elk habitat.

In numerous places throughout the EA, the Forest Service states that collecting data on, and identifying special elk habitat is infeasible (See EA at 69, discussing calving sites; EA at 70 discussing wallows). Instead, the Forest "estimates" where these habitats might occur through a black box process that resulted in the identification of a minimal amount of habitat within the project area.

In other words, the Draft EA fails to provide specific information about the current locations and distributions of elk calving, wallowing, and rutting sites within the Project area. Without this information the Draft EA analysis is based on an inadequate baseline, and the imprecise

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information, paired with inadequate project resource protection measures ("RPMs"), makes it impossible to show the Project's compliance with Ochoco Forest Plan Standards and Guidelines for Rocky Mountain Elk. These standards and guidelines require the Forest Service to: "Protect the character of elk calving sites. Minimize disturbance from human activity during calving season (approximately May 15 to June 30). Also protect wallows during rutting season (September 1 to October 15)."[14] As stated in a previous case on this same issue: "[W]ithout data identifying the location of calving sites and wallows, the Forest Service cannot meet its obligation to protect those sites or minimize disturbance to them."[15] Here, the Draft EA as prepared cannot meet its obligation to protect or minimize disturbance to elk calving and wallowing habitat, and therefore cannot comply with the Ochoco Forest Plan.

The general analysis of calving, rutting, and wallowing habitat—which omits precise locations, their quality, and where locations may exist in relation to Project treatments—violates NEPA's requirements that the agency take a "hard look" at the Project's environmental impacts, and to guarantee that the public receives accurate information about those impacts.[16] This results in inadequate baseline data and prevents the Forest Service from disclosing and analyzing the Project's direct, indirect, and cumulative impacts.[17]

d. Roads

Transportation management is a key part of the proposed project and essential to meeting multiple aspects of the purpose and need, including related to the improvement of RHCAs, big game habitat, and in promoting adaptation to climate change. However, the Forest Service failed to establish an accurate baseline of the road network, and therefore failed to properly analyze the impacts from motorized use within the project area on relevant resources.

In describing the existing road densities within the project area, the EA states:

> Currently, the open road densities within the project area are as follows: General Forest – 2.4 mi/mi2, General Forest Winter Range – 1.0 mi/mi2, and Winter Range – 1.1 mi/mi2 (Table 29). These road densities meet Forest Plan standards and guidelines in General Forest and General Forest Winter Range and are above the density standards in Winter Range. *Surveys performed in 2021 documented vehicle use of maintenance level 1 (closed) roads.*

(EA at 70) (emphasis added). Even with direct evidence of recent vehicle use of closed roads within the Project area, the Forest Service still only includes open roads (Maintenance Level 2-5)

[14] Ochoco Forest Plan- LRMP (1989), Chapter 4, Section 3- Rocky Mountain Elk and Mule Deer 4-246: Protect wallows during rutting season, September 1 to October 15, Protect the character of elk calving sites; Minimize disturbance from human activity during calving season, May 15 to June 30
[15] *WildEarth Guardians v. Jeffries* ("*Guardians*"), 370 F. Supp. 3d 1208 (D. Or. 2018); *see also id.* at 1221.
[16] *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1083 (9th Cir. 2011); *Idaho Sporting Cong. v. Thomas*, 137 F.3d 1146, 1151 (9th Cir. 1998); 40 C.F.R. § 1500.1(b).
[17] *Guardians*, 370 F. Supp. 3d at 1240 (citing Klamath Siskiyou Wildlands Ctr. v. U.S. BLM, 387 F.3d 989, 994–96 (9th Cir. 2004)); see also 40 C.F.R. § 1502.22, 40 CFR 1508.7 "Cumulative impact"

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in the project road density analysis. This is alarming given even the open road density analysis shows road densities above Forest Plan standards and guidelines, and recent surveys indicate that the impacts of the road network are much greater than described in the EA.

The Forest Service must establish an accurate baseline of road density within the project area to comply with NEPA's "hard look" mandate, as the agency must maintain inventories or otherwise collect and disclose information about the resources it manages.[18] This is done so an adequate baseline exists to evaluate the environmental impacts of a proposed action.[19]

Here, the failure to establish an accurate baseline of motorized vehicle use within the project area has major implications for multiple resource values within the project area, including wildlife and their habitat, streams and associated sediment loads, fire risk, and the spread of invasive species. In an EIS, the Forest Service must include the mileage of all maintenance level roads (ML 1-5) that are "functionally" open on the landscape, as well as all user created roads. And especially so, since the Forest Service accounted for all "open on the ground" roads in the wildlife core habitat analysis (See the Draft EA's Appendix C at 1 for discussion of methods used for the core habitat analysis, which did not use maintenance levels but instead considered whether it "was reasonable to assume that the road was receiving any use" including from the public).

V. Logging Trees Large Trees

The 1995 Eastside Screens[20] must be applied across all Project alternatives. As the Forest Service is aware, Judge Hallman of the District of Oregon recently ruled that the Forest Service's 2021 Amendment to the Eastside Screens which eliminated the 21-inch rule was unlawful under NFMA, NEPA and the ESA and that the Screens Amendment should be vacated.[21] Vacatur of the Screens Amendment results in the reinstatement of the 21-inch rule as the controlling Forest Plan standard with which this project must be consistent.[22] Relevant here, the 1995 Eastside Screens prohibit logging trees >21' DBH inside LOS stands under Scenario A. This is made clear by a 1995 interpretive memorandum from the Regional Forester, which states:

> "… the intent of the screens is to maintain, in the short-term, all features of late and old structure, whether the stand is actually LOS or not. … For additional

[18] *See Neighbors of Cuddy Mtn. v. U.S. Forest Serv.*, 137 F.3d 1372, 1379–80 (9th Cir. 1998).
[19] *Id.*
[20] Ochoco National Forest Land and Resource Management Plan (1989), as amended by the 1995 Decision Notice for the Revised Continuation of Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales (i.e. 1995 Eastside Screens)
[21] *See Greater Hells Canyon Council v. Wilkes*, Case No. 2:22-cv-00859-HL, ECF 97 (August 31, 2023).[21] *A Citizen's Guide to NEPA, Having Your Voice Heard,* Council on Environmental Quality, Executive Office of the President, January 2021; 40 CFR 1508.9 (Jan. 3, 2017); 40 CFR 1508.11 (Jan. 3, 2017)
[21] *Id.*
[21] Black Mountain Vegetation Management Project (2019), Paulina Ranger District, Ochoco National Forest, USFS USDA
[21] *See Greater Hells Canyon Council v. Wilkes*, Case No. 2:22-cv-00859-HL, ECF 97 (August 31, 2023)
[22] 16 U.S.C. § 1604(i)

> clarification, the screen direction under Scenario A of the wildlife standard is intended to maintain all live trees >21 inches regardless of tree species and regardless of whether a stand is LOS or not. *The existing wording in Scenario A could be* ***erroneously*** *interpreted to mean that large trees >21 inches "could" be cut in LOS in some instances. We regret the ambiguous wording used in writing Amendment #2.* The intent of Scenario A is as stated above."[23]

While the 1995 Eastside Screens did describe that "timber harvest in Multi-strata with Large trees, like a thinning from below, can be implemented, consistent with the wildlife standard" within LOS, the Regional Forester's memo clarified that this did not include removal of trees >21 inches.

Further, the Ochoco National Forest has also recognized that logging trees >21 inches within LOS is not permissible under Scenario A of the 1995 Eastside Screens. In the Final Record of Decision ("ROD") for the Black Mountain Project, in response to one commenter's request that the Forest Service include an alternative that allowed for harvest of trees >21 DBH inches, the Forest Service responded:

> An alternative that allows for the limited harvest of young shade tolerant/ fire intolerant trees >21 inches diameter at breast height (DBH) was considered but eliminated from further study (FEIS 24). The Regional Forester's Forest Plan Amendment #2 (Eastside Screens) prohibits the commercial removal of trees greater than or equal to 21 inches DBH, regardless of age. In order to remove young trees greater than or equal to 21 inches DBH in the vicinity of old trees as part of the Black Mountain project, an amendment to the Eastside Screens would be required.[24]

The Black Mountain ROD's Appendix D is included as part of these comments as Attachment A.

The Forest Service doubled down on this point in response to objections on the Black Mountain project, finding that:

> The Responsible Official appropriately applied the Eastside Screens and the development of an alternative that allowed the removal of trees >21" would, in fact, require a Forest Plan amendment.[25]

The Black Mountain Objection Response letter is included as part of these comments as Attachment B. In both cases, the Forest Service makes clear that development of an alternative

[23] John Lowe, Nov 14, 1995, File Code: 2430, USDA Pacific NW Region; "Subject: Regional Forester Amendment #2 Implementation – Umatilla NF Trip."
[24] Black Mountain Vegetation Management Project Record of Decision (2019), Appendix D at p80. Paulina Ranger District, Ochoco National Forest, USFS USDA
[25] Jefferies, Shane. 2019. Black Mountain Vegetation Management Project Objection Response Letter. Paulina Ranger District, Ochoco National Forest, USFS USDA

that proposes the removal of trees >21 inches does not conform to Scenario A of the 1995 Eastside Screens.

To conform to the 1995 Eastside Screens large tree logging must be removed from all Project alternatives.

VI. Scale of Analysis

Under the 1995 Eastside Screens, the Forest Service is directed to conduct their analysis at the watershed scale (See 1995 Eastside Screens Appendix B revised, discussing how to conduct the HRV analysis and directing the FS to "[c]haraterize the proposed timber sale *and its associated watershed* for patterns of stand structure by biophysical, environment and compare to the Historic Range of Variability") (emphasis added).[26] Here, the Draft EA's scale of analysis is the project area, not the watershed, thus failing to establish the proper scale for the HRV analysis. In an EIS, the Forest Service should conduct the analysis at the watershed scale.

VII. Riparian Habitat Conservation Areas

As the EA describes, improving and maintaining RHCAs is a key part of the purpose and need for the North Fork Crooked River project (EA at 3, EA at 127). The 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" (EA at 134).

The two action alternatives fail to take appropriate and reasonable actions to address the widespread failure in meeting RMOs within the project area. While the data the Forest Service presents in the Draft EA on stream condition is extremely limited, it paints a damning view of how current management is failing to adhere to INFISH standards and guidelines. To attain RMOs and promote adaptation to climate change, the Forest Service must take a more comprehensive and ecologically sound approach to restoration and management of riparian areas that truly addresses the drivers of habitat degradation. The failure to do so will result in the continued decline of RHCAs and riparian condition across the project area, in violation of the standards and guidelines of INFISH and the Ochoco Forest Plan.

a. Addressing Drivers of Habitat Degradation

Appendix E of the Draft EA provides an overview of the relevant available data from Region 6 Level II surveys and PACFISH/INFISH Biological Opinion Monitoring within the project area. As discussed earlier in this comment, the data presented in Table 82 of Appendix E is outdated

[26] Ochoco National Forest Land and Resource Management Plan (1989), as amended by the 1995 Decision Notice for the Revised Continuation of Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales (i.e. 1995 Eastside Screens)

and incomplete; of the 48 stream reaches that have been surveyed within the project area over the past 30 years:

- 32 stream reaches were last surveyed in the 1990s and 2000s.
- 16 stream reaches were last surveyed between 2009-2020
- Only 4 stream reaches were surveyed in the past 3-5 years

While the data has many limitations, overall the data collected over the past 30 years shows streams in the project area are largely in a degraded condition. Table 82 of Appendix E shows that of the six RMOs represented by data, half are failing across a majority of the stream reaches surveyed. The EA provides further detail on the failure to meet RMOs throughout Chapter 3:

- "[T]hirteen percent (5 out of 39) of the W/D [width to depth] ratios in the project area are *meeting* INFISH standards" (EA at 153) (emphasis added). Another 9 stream reaches included in in Table 82 of the Appendix E have no data recorded at all, meaning the actual percentage of streams failing this standard is likely much higher.

- "Water temperature has not met INFISH standards in any of the years of available data" (EA at 129). This data was summarized from just one data logger within the 37,000-acre project area.

- "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)" (EA at 129). Appendix E shows 83% (10 out of 12 stream reaches) of the streams where shade was measured in the project area are *failing* INFISH standards; another 37 stream reaches included in Table 82 have no data available.

To address the widespread failure of RHCAs in meeting RMOs, the Draft EA's action alternatives propose to log and cut down conifers within RHCAs to promote hardwood recovery, create additional pool habitat, and reduce sediment transport (EA at 139). However, this approach is extremely problematic, and fails to address multiple factors identified in the EA as the underlying drivers of stream degradation or key restoration needs essential to recovery. These factors are detailed further below.

i. Floodplain Connectivity

The EA states that "[m]any channels in the project area are in an incised state and are degraded" (EA at 127). The EA goes on to say that:

> 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.

(EA at 128). In other words, a fundamental driver behind the change in species composition within riparian areas is that streams are disconnected from their floodplains. As such, to effectively reestablish hardwoods and other desirable riparian plant communities, the Forest Service must first address floodplain connectivity and the incised state of streams. Without reconnecting streams to their floodplains, xeric conditions will persist and the restoration of native riparian plant communities—including hardwoods—will fail. This is especially concerning given the many assumptions included in the EA about how removing conifers will ultimately lead to an "abundance of hardwood species," and an array of ecological benefits (See discussion of direct and indirect effects of alternative 2 in EA at 158).

To put it simply, the assumption that cutting down conifers alone will effectively restore hardwoods across the project area RHCAs is fundamentally flawed. This flawed assumption, which is relied upon throughout the EA's analysis, has major implications for the validity of the EA's environmental impact analysis, including on key metrics related to shade, temperature, sediment, livestock grazing, aquatic food sources, and fire (See discussions in EA at 139, 143, 144). In other words, the EA fails to articulate a rational connection between the facts found and the conclusion made.[27]

Perhaps the most concerning of the potential impacts of the proposed project are related to shade and stream temperature. Both action alternatives will lead to an immediate decrease in shade within riparian areas, a key metric that is closely tied to stream temperature. As discussed earlier, 83% of surveyed streams are already failing to meet INFISH standards for shade cover, and no data collected in the project area has ever met INFISH water temperature standards. The EA assumes that removing conifers alone will ultimately lead to an "abundance of hardwood species" which will in the long term, improve shade cover along streams, and therefore reduce stream temperatures. As discussed above, this is a fundamentally flawed approach to restoration that will retard attainment of RMOs and lead to further degradation of riparian areas in the Project area.

To effectively address the failure to meet INFISH standards and guidelines, and to meet the purpose and need of the project, the Forest Service must propose a more robust restoration strategy for riparian areas that includes addressing incised channels and issues related to floodplain connectivity.

[27] *Mtr. Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co*., 463 U.S. 29, 43 (1983). (The agency must "articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made.")

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ii. Livestock grazing

The EA makes numerous references to the negative impacts of livestock grazing on riparian area plant communities, bank stability, instream habitat, and overall stream condition. Examples include:

- "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" (EA at 128)

- "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." EA at 135

- "Past management actions including the exclusion of fire, intensive grazing and removal of beaver have decreased the amount and quality of pool habitat within the watershed." Ea at 157

- "Cattle may have caused shifts in plant species composition and abundance through selection of more palatable forage species. This reduction of plant or shrub abundance may reduce riparian vegetative condition along stream banks along with livestock hoof shear on steam banks may affect bank stability provided by a robust riparian hardwood community. This effect in turn may result in an increase in sediment input that has been shown to result in a reduction in pool depth over time." EA at 159

Even after identifying livestock grazing as one of the key management drivers that has led to the degradation of riparian areas within the project area, the Forest Service makes no attempt to change livestock grazing to attain INFISH standards and guidelines, a key purpose and need of the project.

Even within the Project area there is a powerful example of how removing livestock can substantially improve riparian area conditions; the only sub-watershed within the project area that is currently recognized by the Forest Service as properly functioning is where livestock grazing was removed in 2005. As the EA explains:

> A 2005 assessment of the North Fork Crooked River found the lower section …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.

(EA at 134). To effectively restore the degraded state of riparian areas across the project area and create the conditions necessary to attain RMOs, the Forest Service must address livestock grazing. This must include exclusion of livestock from all riparian areas where

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treatments and restoration actions are proposed, including prescribed burning and thinning.

iii. Roads

The EA makes numerous references to the impact of roads on the ecology of the project area. Examples include:

- "Upland forest suitable habitat has been negatively impacted by roads, trails, and invasive plant infestations. Roads alter runoff patterns, can contribute to soil erosion, fragment native plant communities, and provide corridors for invasive species infestations as vehicles and animals use roads and trails to travel. To support past timber harvest activities, many roads were built in upland forest habitat. Many of these roads remain on the landscape as open system roads" (EA at 101)

- "Roads are known to be primary contributors of sediment to streams. Decreasing road density will have a direct reduction in sediment transport into streams" (EA at 152)

- "The creation/opening of temporary roads will result in a short-term increase in sediment delivered to the stream network which could negatively impact the amount and quality of pool habitat in the project area" (EA at 159)

- "Opening maintenance level 1 roads to administrative maintenance level 2 status would have adverse impacts to soil, water, vegetation, and wildlife habitat conditions…. Increased traffic on previously closed roads may reduce secure habitat for big game" (EA at 169)

Yet, as described in the Travel Management section of this comment, the proposed action alternatives result in a net increase in the motorized road network within the project area. To properly restore RHCAs and create the conditions needed to attain RMOs, the Forest Service must close and decommission more roads, reduce the overall density of the road network, and drastically limit the use of temporary roads for logging.

iv. Adapting to Climate Change

The EA describes a list of actions that the Forest Service could take to assist fisheries and aquatic habitat in adapting to climate change, a key part of the projects purpose and need. For example, the EA states:

> **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,

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> 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.

(EA at 140). While this list largely does not include recommendations on *how* to implement these strategies, it does recommend to "minimize the impacts of roads and grazing." Yet, the Forest Service proposes to only cut and log conifers to assist riparian areas in adapting to climate change while increasing the overall miles of roads open to motorized travel and altogether ignoring grazing impacts. As described below, a more comprehensive strategy is required to implement these primary adaptation strategies for fisheries and aquatic habitats.

v. Recommendations for Addressing RHCA Degradation and Attaining RMOs

The Forest Service should develop site specific restoration plans for RHCAs, with detailed plans for how streams that are currently failing RMOs will be restored to the condition needed to attain RMOs. A key part of this is addressing the drivers of habitat degradation (roads, grazing, timber harvest, etc.), while also restoring key ecological functions necessary to the restoration of plant communities and overall stream health.

Site specific restoration plans, at a minimum, should include:

- Identification of discrete areas where restoration actions are proposed (i.e. restoration footprint)
- Floodplain restoration plan for each site, as appropriate
- Planting of hardwoods and other native species to reestablish native plant communities where streams are connected with their floodplain and/or where otherwise appropriate
- Exclusion of livestock from restoration areas
- Decommissioning and closing roads within RHCAs
- Identification of funding, development of a timeline and a detailed monitoring plan for all road closures and decommissioning
- A plan to increase large woody debris in stream channels to increase pool frequency, through minimal non-commercial, non-mechanized thinning, while also ensuring medium and large conifers remain within riparian areas for future large wood recruitment
- Development of a site-specific prescribed burn plan
- Protection of intact and functioning riparian areas from impacts related to livestock grazing, road development, and timber harvest practices

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- Develop action plan and coordinate with cooperating agencies to facilitate the reintroduction of beaver
- No commercial logging in RHCAs
- Pre and post project monitoring of RMOs and other ecological indicators to assess project effectiveness

b. No Commercial Logging in RHCAs

The Project will be in violation of the Inland Native Fish Strategy ("INFISH") (1995)[28] standards if the action alternatives conduct commercial harvest or thinning in RHCAs. INFISH, which covers approximately 25 million acres of National Forest System lands, includes scientifically supported measures to protect habitat and populations of native inland fish.[29] INFISH was written for all interior native fish species and not just bull trout, and only allows commercial logging in RHCAs in very narrow circumstances, when treatments are needed to attain RMOs. INFISH standards clearly specify that no activity can be done that retards attainment of these RMOs. In other words, INFISH prohibits treatments that will potentially compromise fish habitat, including impacts to shade, water temperature and sediment. All of the action alternatives, as described, will cause impacts to aquatic species and their habitats within RHCAs. This is supported by several expert opinions written for other projects across the Ochoco National Forest with similar riparian and large tree treatments, which can be found in Attachment C of this comment.

Further, the Ochoco Forest Plan Standards and Guidelines are applied to all Forest streams, not just the tributaries where bull trout reside. The Ochoco Forest Plan's Treatment of Activity Fuels section describes desired riparian fuel treatments as:

> Fuel treatment (particularly mechanical treatments) should be very limited within riparian areas. In particular, activities which reduce the shading potential or woody debris sources of the site should be avoided. Greater levels of wildfire risk are acceptable in these areas. Non-Mechanized treatments will receive preference. When mechanized treatments are necessary, they shall be carefully managed to meet the objectives of the management area.[30]

Standard and Guideline TM-1 further states:

> Prohibit timber harvest, including fuelwood cutting, in Riparian Habitat Conservation Areas, except as described below.

[28] USDA, Forest Service. 1995. Pacific Anadromous Fisheries Habitat (PACFISH), U.S. Forest Service and U.S. Bureau of Land Management. 1994. Environmental assessment for the implementation of interim strategies for managing anadromous fish-producing watersheds in eastern Oregon, Washington, Idaho, and portions of California. Washington, DC: U.S. Department of Agriculture, Forest Service. p 68
[29] INFISH 1995; Federal Register / Vol. 60, No. 150 / Friday, August 4, 1995 / Notices 39927
[30] Ochoco National Forest & Crooked River National Grassland, Ochoco Forest Plan- Land and Resource Management Plan (1989), Chapter 4, Section 3, p 4-134

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> …b. Apply silvicultural practices for Riparian Habitat Conservation Areas to acquire desired vegetation characteristics where needed to attain Riparian Management Objectives. Apply silvicultural practices in a manner that does not retard attainment of Riparian Management Objectives and that avoids adverse effects on inland native fish.[31]

Commercial logging in RHCAs is inappropriate even with the Project's identified RPMs because commercial logging in RHCAs would retard attainment of RMOs and negatively affect inland native fish, such as Redband trout. As discussed elsewhere in this comment, many of the RMOs in the project area are either not fully assessed or are largely not being met across the project area. Research shows that treatments and any temporary roads needed to complete these treatments will have further negative impacts on these RMOs (Yonce et al. 2021).

Further, the Draft EA fails to comply with the Ochoco Forest Plan's TM-1 and with the "treatment fuels in riparian areas" philosophy with its commercial logging proposal, as the Draft EA appears to modify RHCA widths for logging without supplying an adequate explanation for the change. INFISH sets RHCA widths to provide stream shading and protect waterbodies from sediment and other ecological harms.[32] These widths are accomplished through mandatory buffers around Category 1–4 waterbodies.[33] The Draft EA, however, states that vegetation management activities are proposed within categories 1, 2, 3, and 4 RHCAs, but does not confirm that the respective mandatory buffers are applied to these waterbodies. Instead, for Alternative 2 the EA states that:

> 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.

(EA at 13). This appears to modify the mandatory buffers of INFISH. The Draft EA has not gone through the proper procedures to alter these buffers and is therefore out of compliance with INFISH and the Ochoco Forest Plan. At a minimum, this lack of clarity in the Draft EA concerning the width of INFISH RHCA buffers that will be applied to the various streams in the Project area does not satisfy NEPA's requirement for disclosure of environmental effects. The Forest Service must restore the INFISH RHCA mandatory buffers around Category 1–4 waterbodies and disclose their location in the Project area and treatment implementation schedule.

[31] Inland Native Fish Strategy, TM-1 (Timber Management), A-7
[32] INFISH Decision Notice and FONSI (1995), Attachment A at A-5 to A-6.
[33] *Id.*

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Additionally, the risk of fire in riparian areas does not justify heavy commercial logging in RHCAs. For example, the EA states there was a lack of modeled difference between Alternative 2 and 3 in fire behavior (See EA at 41), where Alternative 2 proposes commercial and non-commercial logging and Alternative 3 proposes non-commercial only in RHCAs. Regardless, it's important to note that the Ochoco Forest Plan's Standards and Guidelines for Treatment of Activity Fuels states: "[f]uel treatment (particularly mechanical treatments) should be very limited within riparian areas…*Greater levels of wildfire risk are acceptable in these areas*" (emphasis added).[34]

Further, the Ochoco Forest Plan, in describing desired conditions in the MA-F15 riparian areas, states "[w]here coniferous evergreens are a natural component of the ecosystem, a variety of size classes will exist to perpetuate the supply of shade and woody debris over time."[35] The Project continually targets coniferous evergreens in riparian areas despite the Forest Plan discouraging commercial logging of coniferous evergreens in RHCAs and calling for a variety of tree sizes to maintain both shade and woody debris over time.

The Forest Service should remove all commercial logging in RHCAs from the Project, restore INFISH RHCA mandatory buffers around category 1-4 waterbodies, and allow only hand-thinning treatments in non-commercial units where the Forest Service can demonstrate non-commercial thinning will not retard attainment of RMOs.

c. Section 303(d) List of Water Quality Limited Waterbodies

Clean Water Act § 303 establishes the system under which states and the federal government cooperatively develop water quality standards, which apply regardless whether pollution comes from point sources or nonpoint sources.[36] The CWA does not define the term "nonpoint sources," but the Ninth Circuit has stated that, in contrast to point sources, "[n]onpoint sources of pollution are non-discrete sources; sediment run-off from timber harvesting, for example, derives from a nonpoint source."[37] Water quality standards specify, and then protect, the desired conditions of each waterway within the state's regulatory jurisdiction.[38] States are responsible for developing water quality standards applicable to water bodies within their borders, subject to federal confirmation that the standards comply with the requirements of the CWA.[39]

Water quality standards are the benchmarks by which the condition of water bodies is measured: water bodies that do not meet these benchmarks are deemed "water quality-limited" and placed

[34] Ochoco Forest Plan- Land and Resource Management Plan (LRMP) (1989), Chapter 4, Section 3, p 4-134, emphasis added
[35] Ochoco Forest Plan- LRMP (1989), Chapter 4, Section 2, p 4-75
[36] 33 U.S.C. § 1313
[37] *Pronsolino*, 291 F.3d at 1126; *see also Dombeck*, 172 F.3d at 1095 (livestock grazing is a nonpoint source of pollution); *Natural Res. Def. Council v. EPA*, 915 F.2d 1314, 1316 (9th Cir. 1990) (runoff of pesticides from farmlands is a nonpoint source)
[38] *Id*. § 1313(c)(2)(A)
[39] *Id*. § 1313(c)(1) & (3)

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on the CWA § 303(d) list.[40] For all waters placed on this list, states must develop total maximum daily loads ("TMDLs") of pollutants to bring water quality-limited water bodies back into compliance with applicable water quality standards.[41] States must calculate TMDLs regardless of the source of the pollution. *See Pronsolino*, 291 F.3d at 1137. State water quality standards under § 303 apply—and the implementation of TMDLs under that section is required—even when water pollution comes solely from nonpoint sources.[42] Section 303 thus establishes a mechanism by which states can regulate nonpoint sources and ensure that nonpoint source pollution complies with state water quality standards set under that section. Section 401 preserves the state's authority to apply those standards to federally permitted activities.

The Forest Service reports that within the project area there are several streams on the Department of Environmental Quality's 2022 section 303(d) List of "Water Quality Limited Waterbodies" (EA at 129). The EA states that [w]ithin 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). In almost every one of these streams or stream segments, livestock grazing and timber harvest and related infrastructure are contributing significantly to water quality problems.

Given the current state of water quality in the project area, the Forest Service must address livestock grazing and current practices for timber harvesting—including roads and temporary roads. The evidence linking these management activities to riparian degradation and water quality problems is overwhelming and conclusive. This Project provides an opportunity to immediately remove roads and livestock from key stream reaches in order to protect water quality and riparian values. To that end, the Project should include specific actions to achieve water quality standards as rapidly as possible.

VIII. Travel Management

a. Road Density

To identify an appropriate road density throughout the forest and the Project area, the district must fully scrutinize the Project's roadwork component in accordance with the Travel Management Rule.[43] Specifically, the agency must demonstrate how the Project's roadwork components are consistent with the 2015 Ochoco Travel Analysis Report and the identification of the "minimum road system.[44] There are additional requirements for road densities for Ochoco Forest Plan Standard and Guidelines, for 4-224 to maintain the lowest density road system possible, and MA-F20 Winter range and MA-F21 General Forest Winter Range, which are: "Road and trail use will be limited to one mile of open access per section from December 1 to

[40] 33 U.S.C. § 1313(d)
[41] 40 C.F.R. § 130.7
[42] *Id*. at 1140–41
[43] 36 C.F.R. part 212, and Executive Orders 11644, 11989
[44] *Ochoco National Forest & Crooked River National Grassland Forest-wide Travel Analysis Report*, USDA Forest Service 2015; *Travel Management FEIS and ROD*, USDA Forest Service, 2015

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May 1; a greater density of trail and road access will be available during the remainder of the year, up to three miles per section."[45] Here, we are concerned the Forest Service has not complied with all travel management regulations, policy and law.

To address road system alignment with the travel management plan, the Forest Service has done important and meaningful work to identify 9.39 miles of road for decommissioning. However, LandWatch has significant concerns about whether these roads will actually be decommissioned, given the limited road maintenance budget of the Ochoco National Forest (see further discussion below).

Missing from the Forest Service's approach, though, is a true accounting of all functionally open roads as part of a road density analysis. To ensure compliance with the Ochoco Travel Management Plan and Winter Range road density standards and guidelines, the Forest Service must include the milage of functionally open roads, of all maintenance levels and all user created roads, in order to accurately account for road density in the Project area.

This is also necessary to comply with NEPA's "hard look" mandate, as the agency must maintain inventories or otherwise collect and disclose information about the resources it manages.[46] This is done so an adequate baseline exists to evaluate the environmental impacts of a proposed action.[47]

Here, that means accounting for the true density of the functional road network to provide accurate baseline data, in order to properly analyze how the Project alternatives will impact the road system, and therefore impact wildlife habitat and compliance with regulations, standards, and guidelines. Further, in the Project's Core Habitat Analysis (Wildlife Appendix C), the EA describes a more comprehensive approach to assessing the impacts of the road system:

> To quantify the existing condition, all roads and trails that lie within the project area were surveyed and roads were subsequently broken into two categories: 1) open on ground, and 2) physically closed. Roads labeled as 'open on ground' were not defined by their maintenance level as in other analyses (e.g., open road density analysis), but were instead defined by whether it was reasonable to assume that the road was receiving any use.

(EA's Wildlife Appendix C at 1). The EA's Elk Security Analysis describes a similar method, where "motorized routes were defined as any road or motorized trail receiving use by the public regardless of maintenance level or if it was a system road or user-created route" (EA's Wildlife Appendix E at 1). Including all functionally open roads for the elk security analysis and not the

[45] Ochoco Forest Plan- LRMP (1989), Chapter 4, Section 2- MA-F20 Winter Range, 4-83, MA-F21 General Forest Winter Range, 4-85, Section 3, 4-224
[46] *See Neighbors of Cuddy Mtn. v. U.S. Forest Serv.*, 137 F.3d 1372, 1379–80 (9th Cir. 1998).
[47] *Id.*

road density analysis is arbitrary and capricious, and appears to ignore the best available data, represented in the Elk Security and Wildlife Core Area analyses.[48]

The Great Old Broads for the Wilderness, Bitterbrush Chapter, in partnership with LandWatch and others conservation interests, conducted road surveys across the Ochoco National Forest, including within the Black Mountain Vegetation Management Project area, a 34,013-acre area project adjacent to the proposed North Fork Crooked River project. ML 1 closed and decommissioned roads were surveyed in the Black Mountain Project area during the summer and early fall of 2020 to assess how many of the closed or decommissioned roads in the area were physically closed or had a barrier, and if they had been driven that year (the road survey can be found in Appendix B of LandWatch's comment). Out of 115 closed, decommissioned and user-created roads in the Black Mountain Vegetation Project area the surveys identified 63 closed, decommissioned or user-created roads that were open, most with no barrier, and extensively used by the public. Given the close proximity of the Black Mountain Project road surveys to the North Fork Crooked River project area, it is assumed similar issues are present within the Project area.

The use of an accurate road density analysis that includes all functionally open roads is critical for determining the Project's true environmental impacts, and for compliance with the Ochoco Forest Plan winter range and transportation standards and guidelines, and Travel Management Rule.

Further, the Forest Service needs to include an adequate plan for physically closing all ML-1, decommissioned, and user created roads, as this has clearly not been accomplished in past projects. The plan must demonstrate reasonably complete mitigation measures by including an assessment of how effective mitigation can be—due to the current use of "closed" roads, there is no assumption that simply stating the roads will be closed, and using the same unsuccessful closure techniques from past projects, will actually lead to roads that stay closed.[49] In an EIS, the Forest Service must include an assessment and discussion of how the roads will be closed, which needs to include plans for monitoring and enforcement.

b. Timeline for Road Closures and Decommissioning

The Draft EA states that "[i]n recent years, the road maintenance budget for the Ochoco NF has only allowed for routine maintenance on maintenance level 3-5 roads…Due to limited road maintenance funds, and the adverse effects to other resources as a result of reduced maintenance, current conditions do not meet desired conditions" (EA at167). In other words, the limited budget for addressing road related issues does not allow the Forest Service to follow through on its obligations, including to close and decommission roads.

This is particularly concerning related to the Project's proposal to decommission 9.39 miles of roads. As the EA describes, "[t] he decommissioning work mentioned in the above list would be

[48] 5 U.S.C. § 706(2)(A), (D); 36 C.F.R. § 219.3 (Under NFMA, the Forest Service has an obligation to utilize the "best available science")
[49] *S. Fork Band Council of W. Shoshone v. U.S DOI*, 588 F.3d 718, 727 (9th Cir. 2009)

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completed gradually as funds become available" (EA at 168). Here, the Forest cannot even do basic road maintenance, so why would it be assumed in the analysis that without dedicated funds that the proposed work to decommission roads will ever happen? Given this, it is not reasonable to assume that any positive benefits described in the analysis from decommissioning roads will be realized on the landscape, unless the Forest Service can demonstrate how the work will be funded.

The same is true for closing roads that are currently open. The Draft EA states that "Alternatives 2 and 3 would close 6.15 miles of currently open maintenance level 2 road" (EA at 168), but that this work "would be completed gradually as funds become available" (EA at 169).

The Forest Service must commit to a clear timeline for closing and decommissioning roads within the project area and identify specific funding sources to complete this important work. Otherwise, the EA makes clear that this work will not be completed, leaving the EA's analysis flawed where expected benefits to resource values would come from closing and decommissioning roads.

c. Close and Decommission more Roads

There is no difference between the proposed changes to maintenance levels under Alternative 2 and 3 in the Draft EA. As drafted, the EA proposes to:

- Decommission 9.6 miles of roads
- Close 6.15 miles of ML 2 roads
- Upgrade 34.49 miles of ML 1 roads to Administrative ML 2
- Change 28.25 miles of ML 2 roads to administrative ML 2 roads
- Upgrade .33 miles of ML 1 road to ML 2

Overall there is a net gain in roads open to motorized travel within the project area of an alarming 28.67 miles. Further, many roads are proposed for maintenance and reconstruction. The EA states that:

> Under Alternative 2, approximately 122.93 miles of road would receive road maintenance and 21.69 miles of road would receive road reconstruction as part of commercial Timber Sales. Under Alternative 3, approximately 109.81 miles of road would receive road maintenance and 19.38 miles of road would receive road reconstruction as part of commercial timber harvest.

(EA at 172). The proposed miles of road reconstruction under both action alternatives are double the miles of proposed road decommissioning and are guaranteed to happen as part of project implementation, whereas road decommission will only occur "as funds become available."

Further, many temporary roads would be opened or created under both action alternatives. For instance, "[a]pproximately 27.07 miles of maintenance level 1 road in Alternative 2 and 20.23

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miles of maintenance level 1 road in Alternative 3 will be temporarily opened to administrative traffic during commercial Timber Sales" (EA at 173); and "[u]nder Alternative 2, 22.89 miles of temporary road would be constructed" and "Under Alternative 3, 24.23 miles of temporary road would be constructed" (EA at 174).

The net increase in open motorized roads, combined with the large amount of road maintenance, reconstruction, and temporary roads, leads to a substantial increase in the number of roads open to motorized traffic, and an overall increase in the impacts from roads within the Project area. As discussed in the Draft EA and elsewhere in these comments, the impacts of roads on sensitive resource values, including riparian areas, is well established in the scientific literature.

While the EA asserts that the proposed action alternatives decrease the overall open road *density* across the project area, the increase in motorized traffic will still have detrimental impacts to sensitive resource values, including wildlife and water quality. This coupled with the stated fact that the Forest Service does not have adequate funding to decommission or close the roads identified in the EA, the negative impacts from road development within the project area is grossly understated in the EA.

The Forest Service must close and decommission more roads to reduce impacts to sensitive resources, including riparian areas and security habitat, and to meet the projects stated purpose and need.

IX. Special Elk Habitat

All alternatives presented in the Draft EA fail to properly locate and analyze the Project's special elk habitat, such as habitat needed for rutting, wallowing and calving. This in part, has led to a failure to properly assess the negative impacts of the Project on these special habitats.

The elk numbers in the Project area are below Oregon Department of Fish and Wildlife's ("ODFW") set management levels. Given this, the proposed alternatives should be designed to help restore elk habitat and increase elk population numbers. As stated in the Draft EA, managing healthy, stable elk populations is a cooperative effort between the Forest Service and ODFW, with the Forest Service responsible for the management of habitat, and with explicit direction in the Ochoco Forest Plan for the District to "manage elk and deer habitat to meet the population objectives of the ODFW to the extent practicable" (EA at 69). As the Forest Service is tasked with protecting habitat for elk and for meeting or maintaining population objectives set by ODFW to the extent practicable, there is even more onus on the Forest Service to pick a project alternative that best supports rutting, wallowing, calving, connectivity corridors, and other important elk habitat, as elk numbers are already below the level deemed appropriate by ODFW. Merriam-Webster defines "Practicable" as "capable of being put into practice or of being done or accomplished : Feasible."[50] Presenting an alternative that adequately locates and protects special elk habitat like calving and rutting locations is feasible, and is a way for the

[50] Practicable Definition & Meaning - Merriam-Webster

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Forest Service to uphold its duty to meet ODFW management objectives for elk, per the Ochoco Forest Plan.

Additionally, the Draft EA fails to provide specific information about the current locations and distributions of elk calving, wallowing, and rutting sites within the Project area. Without this information the Draft EA has inadequate baseline data, and the imprecise information, paired with inadequate project RPMs, makes it impossible to show the Project's compliance with Ochoco Forest Plan Standards and Guidelines for Rocky Mountain Elk, which requires the Forest Service to: "Protect the character of elk calving sites. Minimize disturbance from human activity during calving season (approximately May 15 to June 30). Also protect wallows during rutting season (September 1 to October 15)."[51] As stated in a previous case on this same issue: "[W]ithout data identifying the location of calving sites and wallows, the Forest Service cannot meet its obligation to protect those sites or minimize disturbance to them."[52] Here, the Draft EA as prepared cannot meet its obligation to protect or minimize disturbance to elk calving and wallowing habitat, and therefore cannot comply with the Ochoco Forest Plan.

For calving, the EA states:

> Calving and fawning primarily occur in proximity to riparian areas that provide access to high quality forage, water, and cover…Identification of specific calving sites is infeasible…There is currently no peer-reviewed literature describing calving and fawning habitat that is specific enough for GIS analysis.

(EA at 69). The EA instead approximates "areas within the project area that have the highest likelihood of providing habitat features important to calving elk" (EA at 69).

Additionally, the Draft EA does not provide specific information on wallows, stating:

> Wallows primarily occur near water in proximity to riparian areas or other moist, soft ground. Numerous areas that potentially support wallows have been identified across the project area such as springs, seeps, bogs, and other wet areas. Much like calving areas, however, use of individual wallow sites may change from year to year based on seasonal fluctuations in forage or availability of water.

(EA at 70). Like with calving, the Draft EA approximates where wallows will be, stating "[w]hile these areas may have suitable habitat components, they are not necessarily utilized by elk for wallowing. However, these locations represent the best-known estimate of areas within the North Fork Crooked River project that contain important habitat attributes to wallowing elk" (EA at 70).

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[51] Ochoco Forest Plan- LRMP (1989), Chapter 4, Section 3- Rocky Mountain Elk and Mule Deer 4-246: Protect wallows during rutting season, September 1 to October 15, Protect the character of elk calving sites; Minimize disturbance from human activity during calving season, May 15 to June 30

[52] *WildEarth Guardians v. Jeffries* ("*Guardians*"), 370 F. Supp. 3d 1208 (D. Or. 2018); *see also id.* at 1221.

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This general analysis of calving, rutting, and wallowing habitat—which omits precise locations, their quality, and where locations may exist in relation to Project treatments—violates NEPA's requirements that the agency take a "hard look" at the Project's environmental impacts, and to guarantee that the public receives accurate information about those impacts.[53] This results in an inadequate baseline and prevents the Forest Service from disclosing and analyzing the Project's direct, indirect, and cumulative impacts.[54]

Further, the Project's proposed RPMs do not go far enough to protect elk special habitat as directed by the Forest Plan.[55] The RPMs do not adequately protect calving and rutting sites during the respective seasons. For calving, one RPM "restricts" but does not prohibit project activities within calving season, and the restricted project activities only apply "within 0.25 miles of identified elk calving areas," and can be waived "with approval of District Ranger, in a particular year if surveys determine calving elk are not present" (Draft EA Appendix B at 246). However, as we discuss above, no known calving areas have been "identified;" instead the Forest Service has only identified habitat features likely to support elk calving. Overall, the Draft EA's conditional RPMs, untethered from specific locations within the project area, fails to comply with the Ochoco Forest Plan Standards and Guidelines for Rocky Mountain Elk.[56]

Further, the Draft EA inadequately analyzes how current cattle allotments impact special elk habitats, including at specific locations for calving and rutting in the Project area. The project area overlaps with seven grazing allotments, and the EA states that "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" (EA at 74). For calving season, the Draft EA similarly concedes:

> The use of high-quality calving and fawning habitat may also be impacted by the presence of livestock within the project area as livestock may be present during calving season and social avoidance of livestock by big game is well documented. These factors would further reduce the total amount of available high quality, undisturbed, and/or secure parturition habitat within the project area.

(EA at 69). The EA should conduct a specific analysis on when and where cattle allotments interact with specific elk calving and rutting sites, as this has a direct impact on elks' ability to effectively use this habitat, and the specifics on how elk are impacted by the Project alternatives. Not accounting for the impacts of grazing on resources in the

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[53] *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1083 (9th Cir. 2011); *Idaho Sporting Cong. v. Thomas*, 137 F.3d 1146, 1151 (9th Cir. 1998); 40 C.F.R. § 1500.1(b).
[54] *Guardians*, 370 F. Supp. 3d at 1240 (citing Klamath Siskiyou Wildlands Ctr. v. U.S. BLM, 387 F.3d 989, 994–96 (9th Cir. 2004)); see also 40 C.F.R. § 1502.22, 40 CFR 1508.7 "Cumulative impact"
[55] Ochoco Forest Plan- LRMP (1989), Chapter 4, Section 3- Rocky Mountain Elk and Mule Deer 4-246: Protect wallows during rutting season, September 1 to October 15Protect the character of elk calving sites; Minimize disturbance from human activity during calving season, May 15 to June 30
[56] Ochoco Forest Plan- LRMP (1989), Chapter 4, Section 3- Rocky Mountain Elk and Mule Deer 4-246: Protect wallows during rutting season, September 1 to October 15Protect the character of elk calving sites; Minimize disturbance from human activity during calving season, May 15 to June 30

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Project area runs afoul of NEPA's requirement to analyze the cumulative impacts of the agency's actions in the Project area, and on elk special habitat. To meet the "hard look" standards, in an EIS, the Forest Service must provide some quantified or detailed information on the impacts of grazing in this project area on special elk habitats.[57]

The Forest Service should also include a timeline of when roads and temporary roads will be closed and decommissioned, and how the conclusions of the EA's habitat analysis are impacted based on the rollout of these actions. Elk security is only improved if the project area has an adequate plan for physically closing the functionally open roads, which includes providing the timing, funding, and plans to monitor and enforce closures.[58] As discussed in the Travel Management section of this comment, the Ochoco National Forest has a concerning history of failing to monitor and enforce closures from past projects, and the lack of funding currently available for road maintenance on the Ochoco National Forest only adds to the alarm. In an EIS, the Forest Service must include specific plans on timing of closures and decommissioning, and plans for monitoring and enforcing closures, to ensure an accurate elk security analysis has been conducted for the Project.

The Draft EA also uses inadequate data for an elk habitat analysis. As acknowledged in the Draft EA, the HEI methodology is outdated and does not use the last 20 years of best available science (EA at 45). Further, it is unclear based on the data in the Draft EA how the HEI numbers were derived. For example, with so many treatments and decreases in canopy cover, it's unclear to LandWatch how the HEI improves with Project implementation. The agency must "explain the conclusions it has drawn from its chosen methodology, and the reasons it considers the underlying evidence to be reliable."[59] LandWatch asks that in an EIS, the Forest Service provide the data, and the reasons it believes this data is reliable, that supports such high HEIs (for example, if road density reduction is the stated reason for HEI improvement, LandWatch asks that this data be included, with an explanation of its reliability).

X. Impacts to Wildlife Habitat

a. Redband

Redband Trout are a Region 6 sensitive species and inhabit all four subwatershes within the project area (EA at 127, 138). As the EA states "[h]istorically, 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" (EA at 128). Here, the proposed project has the opportunity to meaningfully address management issues related to road densities, timber harvest, and livestock grazing, and to chart a long-term restorative path for Redband habitat within the project area.

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[57] *Cuddy Mtn.,* 137 F.3d at 138*; Or. Nat. Res. Council Fund v. Brong*, 492 F.3d 1120, 1134–35 (9th Cir. 2007*); Klamath-Siskiyou Wildlands Ctr. v. U.S. BLM*, 387 F.3d 989, 993–94 (9th Cir. 2004); *Kern v. U.S. BLM*, 284 F.3d 1062, 1075–79 (9th Cir. 2002); 40 CFR 1508.7 "Cumulative impact" (Jan. 3, 2017)

[58] *See, e.g.*, *S. Fork Band Council of W. Shoshone v. U.S DOI*, 588 F.3d 718, 727 (9th Cir. 2009)

[59] *Earth Island Inst. v. Carlton*, 626 F.3d 462, 470 (9th Cir. 2010)

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Instead, the Project as proposed fails to meaningfully address these issues and proposes more roads, commercial timber harvesting in RHCAs, and no actions to address the widespread impacts from livestock grazing.

The EA states that for Redband trout, "[t]he 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 18.0ºC (64.4ºF)" (EA at 142). Yet, as discussed elsewhere in these comments, the state standards are currently not being met within the project area (See also discussion in EA at 142). Particularly concerning here is the Forest Service's proposal to remove conifers in streams where INFISH RMOs for shade and temperature are not being met, while failing to address impacts from livestock grazing, entrenchment and disconnected floodplains, and an extensive road network. With stream temperatures already failing to meet standards for Redband, the project as proposed will only further stress the Redband populations within the project area by removing shade and failing to address drivers of widespread habitat degradation.

Further, the project proposes to increase the miles of roads open to motorized vehicles within the project area. Many authors have reported on the increased sediment load from roads connected to streams, causing increased aggradation of stream beds, filling of pools, enlarged channel widths and widening width-to-depth ratios (Jackson and Beschta 1984, Lisle 1982). As road density increases, there is a clear decline in pool frequency and frequency of large pools, both of which are essential requirements for high-quality fish habitat. Lee et al. (1997) reported that increasing road densities are correlated with declines in the four non-anadromous salmonid species including bull trout, Westslope cutthroat trout, Yellowstone cutthroat trout, and redband trout. As pools are filled in by sediment, they support fewer fish, fish suffer higher mortality, reduce salmonid embryo survival (Bjornn and Reiser 1991; Jensen et al. 2009) and cause decreased fry emergence and juvenile densities, loss of winter carrying capacity, and increased predation (Chapman 1988; Everest et al. 1987; Scrivener and Brownlee 1989; Magee et al. 1996; Weaver and Fraley 1993; Young et al. 1991). High fine sediment load reduces intragravel dissolved oxygen, increases metabolic waste concentrations, decreases intergravel space for aquatic life, and restricts movements of alevins (young fry) (Bjornn and Reiser 1991; Chapman 1988; Everest et al. 1987; Baird et al. 2012). As the EA concedes, "[e]levated background levels of fine sediment are of concern for the negative effects on aquatic biota and in the project area particularly, Redband trout" (EA at 150).

Like the removal of shade, an increase in roads and associated sediment loads also impacts stream temperatures important for Reband trout. Stuart et al. (2007) reported that many streams on the Ochoco National Forest had high temperatures. Their results indicate that redband trout are highly susceptible to increasing water temperatures. Figure 1 below (from Stuart et al. 2007, Figure 7) demonstrates the swift decline in Redband trout abundance as stream temperatures increase, one of the parameters for Redband survival and persistence.

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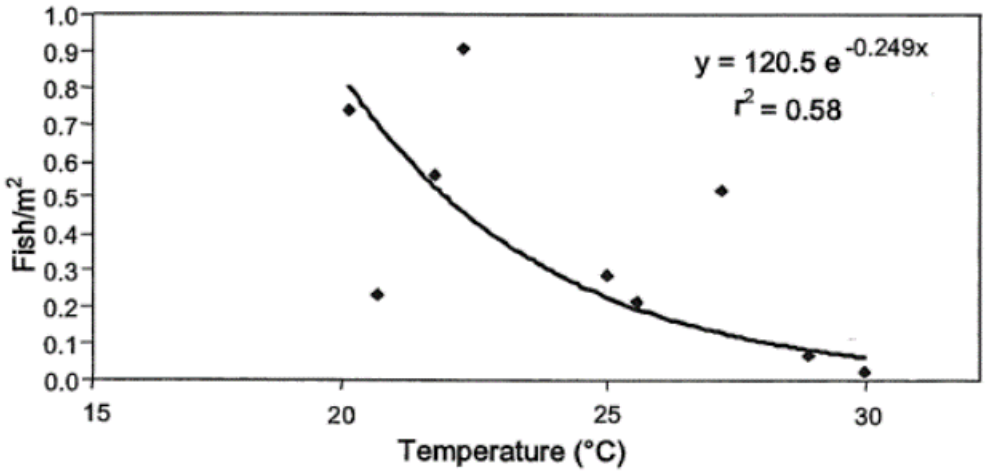

FIGURE 7.—Relationship between density (fish/m^2) of redband trout (all age classes) and maximum water temperatures (°C) in small streams of the Crooked River basin, 1994–1995.

Figure 1. The relative abundance of Redband trout declines as stream temperatures increase (from Stuart et al. 2007).

The EA states:

> These treatments initially may result in a small increase in sediment delivered to the stream network but vegetative recovery following treatment may proceed more quickly and vigorously and prolong the sediment filtering effect over decades and thus help decrease sediment delivery (Luce et al. 2012) along established BMPs and PDCs.

(EA at 151). As discussed elsewhere, "vegetative recovery" is unlikely to proceed more quickly at scale following treatment due to the proposed projects failure to address impacts to riparian areas related livestock grazing, disconnected floodplains, and the extensive road network. Given this assumptions importance to the EA's analysis of the impacts of sediment, LandWatch questions whether the sediment delivery will be a "small increase" and of only short duration.

In areas of the Ochoco National Forest that have low levels of management, including less or no roads, less timber harvest, and less livestock grazing, streams are in relatively good condition and support good populations of Redband trout (Dambacher and Jones 2007, Stuart et al. 2007). For example, populations in areas with low road densities and limited grazing, such as upper reaches of Brush Creek in the Lookout Mountain roadless area, portions of the Mill Creek Wilderness, and in the roadless area along Rock Creek, habitat and fish populations are in reasonably good conditions. Further, within the Project area the only sub-watershed that is currently recognized by the Forest Service as properly functioning is where livestock grazing

was removed in 2005 (See discussion in EA of Rough Canyon Creek subwatershed at 134). In other words, timber harvest removes streamside shade, and increases sediment delivery and water temperature, which can become chronic or acutely lethal to native fish species especially cold-water salmonids.

Because of the proposed projects likelihood of impacting Redband trout habitat, the Forest Service should adopt an alternative that meaningfully address the issues discussed above, and close more roads, removes commercial timber harvesting in RHCAs, and address the widespread impacts from livestock grazing on riparian areas and streams.

b. Mule Deer

As explained in the above section on Special Elk Habitat, managing healthy, stable mule deer populations is a cooperative effort between the Forest Service and ODFW, with the Forest Service responsible for the management of habitat, and with explicit direction in the Ochoco Forest Plan to "manage elk and deer habitat to meet the population objectives of the ODFW to the extent practicable" (EA at 69). While improving mule deer habitat is not a stated project purpose and need, managing habitat for mule deer to meet ODFW's management objectives to the extent practicable is a FS obligation under the Ochoco Foret Plan. The scale of this project, in winter range and in connectivity corridors, seems to be in opposition to this commitment to improve mule deer habitat to support population numbers to the extent practicable.

The Project's proposed treatments in Witner Range MA-F20 seem directly at odds with the emphasis and desired conditions of winter range in the Ochoco Forest Plan; the Forest Service should modify treatments to reflect a reduction in treatments in winter range. Further, the Draft EA fails to provide an explanation and analysis of how winter range is protected December 1 to May 1, and how livestock grazing is managed in winter range to protect big game needs. Adding to this concern, the EA states that all action alternatives would result in a decrease in hiding cover. In an EIS, the Forest Service should drop commercial logging units in big game winter range, should make explicit that no treatments, and especially commercial/ mechanized logging, will occur December 1 to May 1, and should explicitly identify and provide adequate leave patches for mule deer in all seasonal and migratory habitats.

XI. Sensitive Species

The EA states that:

> 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.

(EA at 96). Yet, the EA proposes both commercial and non-commercial treatments within known Peck's mariposa lily populations. Under the RPMs, the EA states that "No ground-based

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equipment would be used within 50 feet of known sensitive plant populations during thinning activities. This RPM does not apply to units with a site-specific CALOP prescription" (EA at 232). In addition, the EA concludes that "stream buffers in commercial thinning units would protect Peck's mariposa lily plants and suitable habitat from the impacts of ground-based equipment" (EA at 98). However, it's hard to understand how these protective measures will be implemented given the extensive treatments proposed within the 425 acres of occupied habitat.

For example, alternative 2 proposes to commercially treat 13% of all known populations; alternative 3 proposes to commercially treat 6% of all known populations. Additionally, alternative 2 proposes to non-commercially treat 28% of all know populations; and alternative 3 proposes to non-commercially treat 73.8% of all know populations. In other words, the two action alternatives propose to treat anywhere from 28% to 73.8% of the known populations (or more depending on the degree of overlap between commercial and non-commercial treatments). It's unclear how the proposed buffers will eliminate impacts to these populations when such extensive disturbance is proposed.

Further, while the EA claims that road closures and decommissioning will ultimately benefit Peck's mariposa lily—actions which are not funded and have no proposed timeline for implementation—the EA also opens previously closed roads to motorized travel that bisect Peck's mariposa lily populations (EA at 100). Similarly, proposed temporary roads are described as bisecting populations, and the EA states that "some disturbance in occupied Peck's mariposa lily habitat" will occur from the construction of temporary roads.

To protect these sensitive plant populations, the Forst Service should close and decommission more roads, provide funding and timelines for road closures and decommissioning, and not open up new roads to motorized travel or construct temporary roads that travel past or bisect Peck's mariposa lily populations. As the EA makes clear, roads pose a significant threat to the remaining plant populations through sedimentation, changes in hydrology, compaction and impacts to infiltration rates, and by substantially increasing the risk of invasive plant species spread (EA at 100).

Further, the Forest should remove all commercial and ground-based mechanical treatments from the 425 acres of known Peck's mariposa lily populations. Non-commercial treatments should be scaled back and conducted by hand to reduce impacts from sedimentation, compaction, and the risk of spreading invasive species.

XII. Connectivity Corridors

a. 1995 Eastside Screens

The EA states that "[c]onnectivity 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" (EA at 87). However, no information about where connectivity corridors were identified, how many were identified, or how large current connectivity corridors are, is provided in the EA. The omission of this information leaves the public in the dark about the baseline data related to these critical wildlife habitat features and whether the project conforms to the 1995 Eastside Screens standards.

The 1995 Eastside Screens state that "(4) Harvesting within connectivity corridors is permitted if all the criteria in (2) above can be met, and if some amount of understory (if any occurs) is left in patches or scattered to assist in supporting stand density and cover."[60] Criteria (2) provides a description of stand characteristics within connectivity corridors, describing "[s]tands in which medium diameter or larger trees are common, and canopy closures are within the top one-third of site potential. Stand widths should be at least 400 ft. wide at their narrowest point.[61]

The EA describes that:

> 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.

(EA at 87). Yet, no information about the current conditions within connectivity corridors, or how proposed prescriptions would be modified is provided in the EA.

The EA goes on to state that:

> 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.

(EA at 88). Here, the EA provides no maps of where LOS is located within the project area, or where the identified corridors that connect LOS are located. Further, no information is provided about the current canopy cover within corridors, what the identified "site potential" of each corridor is, what level of thinning is proposed (or allowed) within each corridor, or what measures will be taken to ensure these key wildlife habitat features are protected and managed in accordance with the 1995 Eastside Screens.

The EA states that "Resource Protection Measures exist for commercial and noncommercial thinning treatments and would leave portions of units in un-thinned patches…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*" (EA at 87) (emphasis added). Yet, the RPMs described in Appendix B of the Draft EA provide very little additional guidance related to connectivity corridors. In fact, there is only one RPM that explicitly mentions connectivity corridors, which states that "[b]urning within goshawk post-

[60] Ochoco National Forest Land and Resource Management Plan (1989), as amended by the 1995 Decision Notice for the Revised Continuation of Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales (i.e. 1995 Eastside Screens), Appendix B p11.
[61] Ochoco National Forest Land and Resource Management Plan (1989), as amended by the 1995 Decision Notice for the Revised Continuation of Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales (i.e. 1995 Eastside Screens), Appendix B p10.

fledging areas and connective corridors would be designed to minimize loss of mid and overstory cover, snags, and large down wood" (EA at 145). While this RPM may assist managers in implementing prescribed burning in goshawk habitat, it is silent on how to minimize impacts related to other proposed treatments, including logging across broader connectivity corridors.

One additional RPM does appear to relate to connectivity corridors. It states that for "select commercial and non-commercial harvest units" the Forest Service should "retain patches of cover and provide for diversity of wildlife habitats in a mosaic pattern within treated units" by "[l]eave[ing] a portion of treatment area in un-thinned patches, except where desired conditions are in direct conflict" (EA at 246). Yet, no site-specific information is provided, including for example which "select harvest units" this would apply to, or how many or how big un-thinned patches should be.

The EA's general analysis of connectivity corridors—which omits precise locations, current condition, and where Project treatments would be in relation to corridors—violates NEPA's requirements that the agency take a "hard look" at the Project's environmental impacts, and to guarantee that the public receives accurate information about those impacts.[62] This results in inadequate baseline data and prevents the Forest Service from disclosing and analyzing the Project's direct, indirect, and cumulative impacts.[63]

b. Adequate Leave Patches

As discussed above, the RPMs provide the public with little information about how the project will meaningfully protect wildlife. The Forest Service must provide more information on the location and size of leave patches, including how leave patches correspond to the different habitat needs of the many species impacted in the Project area, and how the leave patches support wildlife during the various implementation stages of the Project.

Further, the Project is largely silent on the action alternatives' impacts to any wildlife connectivity corridors outside of impacts to the Northern goshawk, which has specific connectivity requirements described in the Wildlife Standard of the Regional Forester's Forest Plan Amendment #2 (Eastside Screens). In an EIS, the Forest Service must address other connectivity corridors in the Project area, and how the proposed actions might impact these corridors. For example, the EIS should analyze impacts to known big game migration corridors between summer and winter range in the Project area. The Forest Service should incorporate this information for all relevant species analyzed in an EIS.

[62] *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1083 (9th Cir. 2011); *Idaho Sporting Cong. v. Thomas*, 137 F.3d 1146, 1151 (9th Cir. 1998); 40 C.F.R. § 1500.1(b).
[63] *Guardians*, 370 F. Supp. 3d at 1240 (citing Klamath Siskiyou Wildlands Ctr. v. U.S. BLM, 387 F.3d 989, 994–96 (9th Cir. 2004)); see also 40 C.F.R. § 1502.22, 40 CFR 1508.7 "Cumulative impact"

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c. Priority Wildlife Connectivity Areas

The Forest Service should consider how to preserve and restore habitats within ODFW identified Priority Wildlife Connectivity Areas ("PWCAs"). PWCAs are "an interconnected network representing the parts of the landscape with the highest overall value for facilitating wildlife movement in Oregon."[64] As stated on the ODFW's Oregon Conservation Strategy website, PWCAs can help inform on-the-ground conservation action and planning, including the identification of restoration priorities, and informing land management decisions related to wildlife habitat on federally managed lands.[65] The Forest Service should incorporate PWCAs into the analysis to help prioritize the management of wildlife habitat to facilitate seasonal movements and species' adaptation to climate change.

XIII. Adequately Accounting for Impacts on Carbon Release and Climate Change

The Project fails to adequately address the Project's carbon emissions impacts—a general explanation of the Project's emissions does not satisfy NEPA's hard look standard.[66] In an EIS, the Forest Service must specifically address significance at the local scale; the courts have consistently held that the failure to address significance in the proper context is a violation of NEPA.[67] Per NEPA, the Forest Service must also present more than a statement of platitudes—the public must be able to see and understand the actual impacts of an individual project.[68] Specifically, the USFS is required to determine "the extent to which this particular project's [carbon emissions] will add to the severe impacts of climate change."[69]

The Project's analysis does not even consider greenhouse gas emissions, and in fact, the word emissions does not even show up in the EA. *CBD v. USFS* explicitly states: "USFS has the responsibility to give the public an accurate picture of what impacts a project may have, no matter how "infinitesimal" they believe they may be.[70] Here, the Draft EA has failed to provide that accurate picture. LandWatch asks that a site-specific scale of analysis of the Project's carbon emissions and their impacts are provided in an EIS.

Given part of the project purpose and need to is "promote adaptation to climate change," the omission of key information related to climate impacts of the proposed project are alarming and do not conform to President Biden's Executive Order 140721, Strengthening the Nation's Forests, Communities, and Local Economies, which outlines the important role our federally managed forests play in reaching net-zero greenhouse gas emissions.[71]

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[64] Priority Wildlife Connectivity Areas (PWCAs) – Oregon Conservation Strategy (last accessed on November 29, 2023)
[65] *Id.*
[66] *CBD v. USFS*, Case 9:22-cv-00114-DWM Filed 08/17/23 (D. Mont.)
[67] See, e.g., *Anderson v. Evans*, 371 F.3d 475, 492 (9th Cir. 2004).
[68] *CBD v. USFS,* Case 9:22-cv-00114-DWM Filed 08/17/23 (D. Mont.)
[69] *Id*., citing *Montana v. Haaland, 350 Mont., 50 F.4th at 1266*
[70] *CBD v. USFS*, Case 9:22-cv-00114-DWM Filed 08/17/23 (D. Mont.)
[71] Biden, J. 2022. Executive Order 140721 of April 22, 2022. Strengthening the Nation's Forests, Communities, and Local Economies.

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Several studies have found that the emissions from logging may in fact exceed the emissions that would occur if wildfire encountered the same Project area, as the amount of carbon removed is often much larger than that saved, and more area is harvested than would actually burn (Law et al. 2018; Law and Harmon 2011). Law et al. (2018) looked at all carbon emissions in 2001-2005, and again in 2011-2015, and found:

> …in 2001–2005, Oregon's net wood product emissions were 32.61 million tCO2e, and 3.7-fold wildfire emissions in the period that included the record fire year. In 2011–2015, net wood product emissions were 34.45 million tCO2e and almost 10-fold fire emissions, mostly due to lower fire emissions. The net wood product emissions are higher than fire emissions despite carbon benefits of storage in wood products and substitution for more fossil fuel-intensive products.

Berner et al (2017) found that tree mortality from fires and bark beetles "were both ~40% lower than earlier best-estimates reported by Hicke et al. (2013)." While fire was the leading cause of emissions in California, as stated above, carbon released from fire is eclipsed by logging in Oregon and Washington, where:

> Tree mortality from timber harvest was highest in Oregon and Washington and accounted for ~80% of [mortality, as defined] in these states… Recent tree mortality from timber harvest far exceeded tree mortality caused by both bark beetles and fires in the Pacific Northwest, highlighting that reductions in timber harvest could help these states meet GHG emission reduction targets.

(Berner et al 2017).

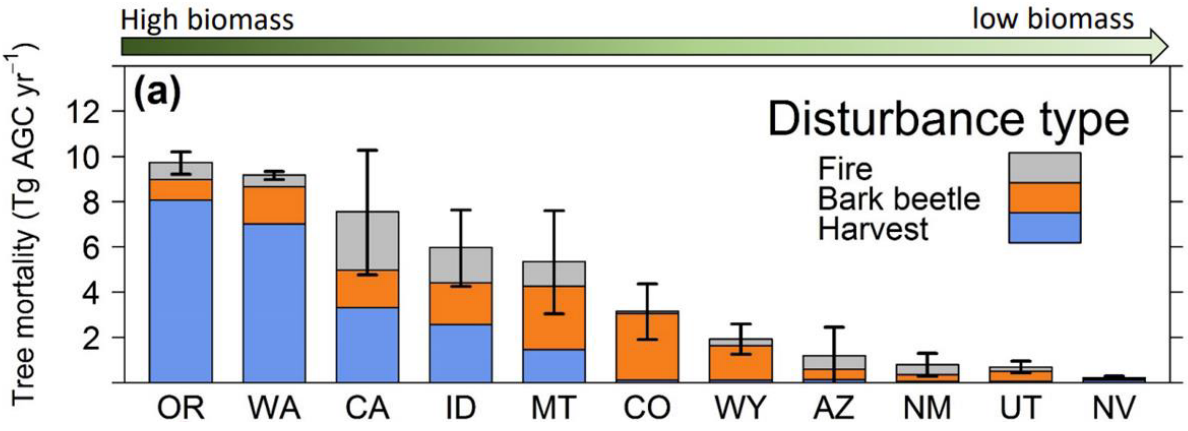

Figure 2. Mean annual tree mortality from fires, bark beetles, and timber harvest on forestland from 2003–2012 for each state in the western US. Tree mortality was quantified as the amount of aboveground carbon (AGC) stored in tree biomass killed by disturbance. (Berner et al. 2017)

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An even more recent study specifically compares carbon emission from fire as compared to the harvest of mature trees:

> We find that forest fire carbon emissions are on average only 6% of anthropogenic FFE over the past decade. While wildfire occurrence and area burned have increased over the last three decades, per area fire emissions for extreme fire events are relatively constant. In contrast, harvest of mature trees releases a higher density of carbon emissions (e.g., per unit area) relative to wildfire (150–800%) because harvest causes a higher rate of tree mortality than wildfire.

(Bartowitz et al 2022).

Further, the process of transferring carbon from live biomass to harvest wood products is a massively carbon intensive process. Carbon is lost at every stage—from the harvest itself, the manufacturing of products, the end of the products' use, and decay. Over the past 100 years of logging, 65% of the wood product carbon has returned to the atmosphere, and 16% has been transferred to landfills (Hudiburg et al 2019; Law et al. 2018). The most effective way to contribute to carbon sequestration is to preserve trees, not log them. In Eastside forests, 3% of large trees are storing 42% of the forest's above ground carbon (Mildrexler et al 2020)—the Final EIS should give a full accounting of its actual emissions for each alternative and note any large trees it removes as taking away from this carbon sink.

XIV. Wild and Scenic Rivers

Congress enacted the Wild and Scenic Rivers Act ("WSRA") in 1968 to identify rivers that possess "outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values" and to preserve those rivers in free-flowing condition and protect their immediate environments "for the benefit and enjoyment of present and future generations."[72] A river is eligible for designation and protection under the WSRA if it is a free-flowing stream and the adjacent land area possesses one or more of the "outstandingly remarkable values" ("ORVs") enumerated in § 1271.

Once a river corridor is designated, the federal agency charged with administration of that corridor must prepare a comprehensive river management plan "to provide for the protection of the river values"; to "address resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes" of the Act; and to coordinate the river plan with land use planning.[73]

Every river included in the system, regardless of its classification as wild, scenic, or recreational, "shall be administered in such manner as to protect and enhance the values which caused it to be

[72] 16 U.S.C. § 1271
[73] *Id*. § 1274(d)(1).

included in said system."[74] "[P]rimary emphasis shall be given to protecting its esthetic, scenic, historic, archeologic, and scientific features."[75] In addition to protection of a river's free-flowing condition and outstandingly remarkable values, the WSRA specifies that managing agencies must protect the water quality of all rivers added to the system.[76]

Within the Project area there are two segments of the North Fork Crooked River that are analyzed in the EA. As the EA states:

> The outstandingly remarkable values identified for Segments 3 and 4 of the North Fork are scenic values and botanical values (other similar values). Scenic values were determined to meet the criteria as an ORV because of the old growth ponderosa pine, larch, aspen, and willow, a ribbon of riparian vegetation along the river, open grassy meadows seasonally filled with wildflowers, and the rippling river. Botanical resources were determined to meet the criteria as an ORV because of the old growth ponderosa pine forests and sensitive plant species (e.g. Peck's mariposa lily) located near the river (USDA/USDI 1993).

(EA at 181). The 1993 Crooked River Wild and Scenic River ("WSR") Management Plan states that sensitive plant species, such as *Calochortus longebarbatus* var. *peckii* (Peck's mariposa lily), are found within segments 3 and 4.[77] However, the EA states that "[t]he 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" (EA at 182)(emphasis added). Here, we are concerned that the Forest Service has not complied with all relevant provisions of the WSR Management Plan. LandWatch asks the Forest Service to provide site-specific information about where treatments are proposed within the WSR corridor to help clarify how treatments relate to sensitive plant species, ORVs, and other significant values within the WSR corridor.

The WSR Management Plan provides standards and guidelines for Instream Resources and Riparian Habitat:

> The outstandingly remarkable botanical values within the river corridor will be protected and monitored. This includes the riparian vegetation in Segment 5, and populations of threatened, endangered, and sensitive plants including *Calochortus longebarbatus* var. *peckii* (Peck's mariposa lily) found throughout the river corridor.[78]

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[74] *Id*
[75] *Id*
[76] *Id*. §§ 1271, 1283(c).
[77] USDI. 1993. North Fork Crooked Wild and Scenic River Management Plan, Record of Decision and Finding of No Significant Impact. USDI Bureau of Land Management, Prineville District; USDA Forest Service, Ochoco National Forest. Prineville, Oregon.
[78] USDI. 1993. North Fork Crooked Wild and Scenic River Management Plan, Record of Decision and Finding of No Significant Impact. USDI Bureau of Land Management, Prineville District; USDA Forest Service, Ochoco National Forest. Prineville, Oregon.

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Here, the WSR Management Plan makes clear that sensitive plant species found throughout the river corridor will be protected and monitored. LandWatch asks that the Forest Service clarify what measures will be taken to protect and monitor sensitive plant species, such as Peck's mariposa lily within proposed non-commercial and commercial units.

Further, the EA makes clear that the WSR Management Plan only allows timber harvest, including thinning, under certain conditions:

> Each segment however 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.

(EA at 181). Because of this, the Forest Service should not conduct any commercial harvest within the WSR corridor, and any proposed treatments should exclude mechanized equipment to reduce impacts to riparian areas and water quality.

XV. Conclusion

Thank you for the opportunity to comment on this project and please reach out if you have any questions or would like to discuss the comments in this letter. Please retain LandWatch on your list of interested public.

Sincerely,

Jeremy Austin
Wild Lands & Water Program Manager
Central Oregon LandWatch
2843 NW Lolo Dr St. 200
Bend, OR 97703

Cc:

Ben Gordon, Executive Director
Central Oregon LandWatch

Attachments (as stated)

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Attachment A

Black Mountain Vegetation Management Project Record of Decision Appendix D

Appendix D – Response to Comments on the DEIS

Introduction

The Paulina Ranger District provided the public with a 45-day Notice of Availability and Opportunity to Comment for the Black Mountain Vegetation Management Project Draft Environmental Impact Statement (DEIS). The comment period began on December 14, 2018 and ended February 28, 2019. Twenty-nine letters were received from members of the public, federal officials, and public interest organizations.

During the 45-day Notice of Availability and Opportunity to Object on the Black Mountain Vegetation Management Project Final Environmental Impact Statement (FEIS) and Draft Record of Decision (ROD), one objector expressed concern that the FEIS did not include a response to their comments on the DEIS from January 28, 2019. Upon review of the project record and discussion with the interdisciplinary team, I verified the objector's comments on the DEIS were reviewed, annotated and placed in the project record; however, the comments were not included in the Response to Comments in the FEIS due to an oversight that has been corrected. A revised Response to Comments that includes all responses is included below.

Content Analysis

A standardized content analysis process was conducted to analyze the public letters received on the DEIS. Content analysis is designed to extract comments from each letter received, evaluate similar comments from different letters, and identify topics of concern. Additionally, content analysis ensures that every comment is considered fairly and accurately represents the breadth and depth of the public's viewpoints. All letters and comments have been treated equally. They are not weighted by status of respondents or organizational affiliation and it does not matter if an idea was expressed by several people or a single person. During the content analysis process, each letter was assigned a unique tracking number. Content analysts then read letters in their entirety and proceeded to identify discrete comments within them. Each letter may have contained anywhere from one to fifty comments. Each comment was coded based on a particular concern, resource consideration, or proposed management action expressed.

How to Use This Comment Response Document

While all comments were reviewed and considered, only specific written comments as defined in 36 CFR 218.2 received a detailed response in the document below. Examples of specific written comments include those comments that provided new information; identified a new issue; identified a different way to meet the purpose and need; pointed out a flaw in the analysis; or identified a different source of credible research. General statements of support, opposition, or alternative preferences; comments outside the scope of the project; comments pertaining to issues already decided by law regulation or policy; or comments already addressed in the draft Environmental Impact Statement (DEIS) are not included. In some cases, comments may have been summarized or paraphrased and similar comments may have been grouped into public concern statements. Pages, chapters, or sections cited within the response to comments refer to the Black Mountain Vegetation Management Project Final Environmental

Impact Statement (FEIS) unless otherwise noted. A complete record of all letters submitted during the 45-day comment period, is available online in the Black Mountain Vegetation Management Project Public Reading Room at https://cara.ecosystemmanagement.org/Public//ReadingRoom?Project=44954 or in the project file located at the Paulina Ranger District.

Commenters

1: Kim McCarrell
2: Becky Wolf
3: Geo Wuerthner
4: Amy Terepka
5: Arlene Hansen
6: Mark Canright
7: Carolina Hood
8: American Forestry Resource Council (AFRC) –Irene Jerome
9: Stephanie Taylor
10: Rocky Mountain Elk Foundation (RMEF) – Bill Richardson
11: Oregon Wild – Doug Heiken
12: Central Oregon Landwatch – Rory Isbell
13: Native Plant Society of Oregon (NPSO) – Jason Clinch
14: Rod Adams
15: Diane Hodiak
16: Alice Elshoff
17: Jessica Jern
18: Carol Savonen
19: Sierra Club Juniper Group – Mathieu Federspiel
20: Blue Mountain Biodiversity Project – Karen Coulter
21: Environmental Protection Agency – Jill Nogi
22: Ochoco Forest Restoration Collaborative
23: Blue Mountain Biodiversity Project – Paula Hood
24: Barbara Franano
25: Great Old Broads for Wilderness
26: Interfor US – Dylan Fritz
27: Oregon Department of Fish and Wildlife (ODFW) – Sara Gregory
28: Department of the Interior, Office of Environmental Policy and Compliance – Allison O'Brien
29: Michelle McSwain, Betty Roppe, John Jackson, Pam Hardy, John Shelk, Tom Casselman, Gayle Cassleman, Ruth Miller, Duane Miller, Kit Dickey, Jerry Brummer, Frank Porfily, Cliff Kiser

Response to Comments

Pages, chapters, or sections cited within the response to comments refer to the Black Mountain Vegetation Management Project Final Environmental Impact Statement (FEIS) unless otherwise noted..

Table 13. Response to comments on the DEIS

Comment Number	Commenter	Comment	Response
PURPOSE AND NEED			
1	8; 26	The ONF should add a statement to the purpose and need that clearly articulates the importance of contributing to economic viability and support to the local infrastructure. Contribution to the economic viability and support of local infrastructure is critical to the implementation of the stated items in the purpose and need of the project. Supporting local industry and providing useful raw materials to maintain a robust manufacturing sector should be a principal objective to any project on Forest Service land.	The ONF has the discretion to determine the purpose and need for project proposals. For the Black Mountain project, the ONF developed the purpose and need by comparing the existing conditions in the project area to: goals, objectives and desired conditions identified in the Forest Plan, as amended; historic conditions in dry forests in the project area (historic range of variability); best available science regarding dry forest restoration; and goals and objectives identified in the National Cohesive Wildland Fire Management Strategy developed by the U.S. Department of the Interior and the U.S. Department of Agriculture.
2	12; 25	The ONF should include restoration goals in the Purpose and Need that would restore fish and wildlife habitat. While actions to restore streams are discussed later, the entirety of this section is all about restoring forests without discussing the need to restore fish and wildlife habitats.	The ONF has the discretion to determine the purpose and need for project proposals. The focus of the Black Mountain project is vegetation management.
3	22	The purpose and need statement for this project is well written and clearly articulates the need for action to restore forest resilience. We support the Black Mountain project's efforts to address this situation by reducing stand densities while maintaining fire and drought tolerant species like ponderosa pine. This will set dry forests on a trajectory to develop over time into the resilient dry forests that were historically present across more than half of the Ochoco National Forest landscape (Franklin et al., 2013; Hessburg et al., 2015; Merschel et al., 2014; Ochoco Forest Restoration Collaborative, 2017). The purpose and need outlined for this project is in line with OFRC's social values for forest health and resilience, public safety, and local economic well-being.	Thank you for your comment.
PROPOSED ACTION			
4	21	We agree that the Proposed Action would lead to more resilient dry forest conditions in the project area, including within Riparian Habitat Conservation Areas.	Thank you for your comment.
5	22	We support the use of commercial thinning where appropriate to move the forest towards desired future conditions and ask that this be carried forward in the Black Mountain EIS. We believe that dry forest restoration treatments should be designed with the goal of putting	Thank you for your comment.

Comment Number	Commenter	Comment	Response
		forests on a trajectory towards historic range of variability. Treatments are best evaluated not by trees that are removed but by the health and reliance of forest that are created. Our Dry Forest Recommendations describe detailed desired future conditions for dry forest types based on topographic position and historical references (Ochoco Forest Restoration Collaborative, 2017). Achieving historical density and species composition to restore forest reliance will often require the removal of commercially valuable material.	
ALTERNATIVES			
6	12; 25	The ONF should include an alternative that would combine no new temporary roads and no commercial harvest in RHCAs. The new proposed alternative would eliminate impacts to wildlife habitat, streams and riparian areas caused by temporary roads, skid roads, landings and logging to soils. While we realize this new alternative would reduce the area proposed for commercial thinning by 2,125 acres (6.2% of the project area), the new alternative would minimize impacts to RHCAs, and retain more mixed conifer that is important wildlife cover.	A "no temporary road construction" alternative in which all commercial thinning would be conducted from existing system roads and no temporary roads would be constructed was considered but eliminated from further study (FEIS 23). The interdisciplinary team (IDT) analyzed each unit to determine the feasibility of commercial thinning from existing system roads. As a result of this analysis, many units were dropped or reduced in size due to access limitations, reduction in safe and practical operations, and increased environmental impacts. Selection of this alternative would reduce the area that would receive commercial thinning by 2,125 acres which means 41% of the area needing restoration would not be treated. Under this alternative, untreated stands would continue to be vulnerable to mortality from competition with understory trees and the accompanying increase in risk to loss owing to insects, disease and stand replacing wildfire. This alternative would reduce restoration opportunities of some aspen stands and other hardwood communities. This alternative would not demonstrably move the project area towards the future desired condition and would not meet the purpose and need, therefore this alternative was not carried forward in the analysis.
7	22	The ONF should include an alternative that allows for the limited harvest of young shade-tolerant/fire intolerant trees >21" DBH inches, as discussed in our *Dry Forest Recommendations*.	An alternative that allows for the limited harvest of young shade-tolerant/fire intolerant trees >21 inches diameter at breast height (DBH) was considered but eliminated from further study (FEIS 24). The Regional Forester's Forest Plan Amendment #2 (Eastside Screens) prohibits the commercial removal of trees greater than or equal to 21 inches DBH, regardless of age. In order to remove young trees greater than or equal to 21 inches DBH in the vicinity of old trees as part of the Black Mountain project, an amendment to the Eastside Screens would be required. An amendment can be Forest-wide, meaning it applies to the current project and all future projects; or an amendment can be project specific, meaning it only applies to the current project. The conditions in the Black Mountain project area are not unique and occur elsewhere on the Ochoco National Forest, therefore a project specific amendment would not be applicable to this project. A Forest-wide amendment to the Eastside Screens is beyond the scope and scale of the Black Mountain project. Because a Forest-wide or project specific

Comment Number	Commenter	Comment	Response
			amendment will not be prepared, this alternative was not carried forward in the analysis.
	10	The ONF should correct the ambiguity regarding untreated “high risk” acres in Table 4 - Comparison of Effects by Alternative. As written, they can be interpreted as indicating that 70 percent of both the “High Risk” and stand density acres of forest are left untreated or 30 percent untreated. Further, why are the untreated acres not treated?	The measures for the Forested Vegetation resource indicators have been edited for clarity. Table 4 shows the acres of high density condition and/or grand fir, Douglas-fir, western juniper development remaining and acres of high susceptibility condition remaining in the Black Mountain project area with each alternative (FEIS 25). Acres are left untreated for a variety of reasons including steep slopes, road access, Forest Plan management allocations (e.g. Old Growth Management Areas) and/or stand conditions that are not conducive to commercial thinning or partial removal cutting (i.e. they should be regenerated with something like a clearcut, shelterwood or seedtree harvest which is not included in the Black Mountain project).
HARVEST OF TREES >21 INCHES DBH / FOREST PLAN AMENDMENT			
8	8; 26	The ONF should not eliminate the alternative including harvest treatments of trees 21 inches or greater in diameter. This is a significant change from the scoping document where removal of trees greater than or equal to 21 inches dbh was proposed utilizing forest plan amendments. We do not agree with the statement that "a forest-wide amendment is beyond the scope and scale of the Black Mountain project".	An alternative that allows for the limited harvest of young shade-tolerant/fire intolerant trees >21 inches diameter at breast height (DBH) was considered but eliminated from further study (FEIS 24). The Regional Forester’s Forest Plan Amendment #2 (Eastside Screens) prohibits the commercial removal of trees greater than or equal to 21 inches DBH, regardless of age. In order to remove young trees greater than or equal to 21 inches DBH in the vicinity of old trees as part of the Black Mountain project, an amendment to the Eastside Screens would be required. An amendment can be Forest-wide, meaning it applies to the current project and all future projects; or an amendment can be project specific, meaning it only applies to the current project. The conditions in the Black Mountain project area are not unique and occur elsewhere on the Ochoco National Forest, therefore a project specific amendment would not be applicable to this project. A Forest-wide amendment to the Eastside Screens is beyond the scope and scale of the Black Mountain project because analysis for a Forest-wide amendment would require extensive analysis of the entire Ochoco National Forest, as opposed to just the Black Mountain project area. Because a Forest-wide or project specific amendment will not be prepared as part of the Black Mountain project, this alternative was not carried forward in the analysis.
9	8	The ONF should reconsider removal of trees >21 inches DBH for specific units or unit areas where specific justification is available. AFRC is aware that the Snow Basin decision rejected site-specific amendments because of a lack of unique site characteristics. However, the Snow Basin decision recognized that the combination of unique site characteristics and Forest Service expertise would be sufficient for site-specific amendments to be upheld. On Black Mountain, there is a biological need to remove trees over 21” dbh and there is legal	Please see comment/response 8.

Comment Number	Commenter	Comment	Response
		justification for amending the Forest Plan accordingly. We are concerned that the Forest Service initially supported removal of 21" trees during the scoping phase but changed that during the DEIS process.	
10	10	The ONF should reconsider removal of trees >21 inches DBH to comply with best available science. The DEIS page 34 cites scientific research supporting harvest of trees 21 inches diameter (dbh) and greater in relation to the conditions found in this project, states the conditions in this project area are found across the Ochoco National Forest, and then states a forest-wide amendment to allow trees greater than 21 inches dbh to be harvested will not take place. The decision to not seek and amendment does not appear to comply with the NEPA requirement to use best science.	Please see comment/response 8.
11	22	The ONF incorrectly states that the Regional Forester's Forest Plan Amendment #2 (Eastside Screens) prohibits the commercial harvest of trees >21" DBH regardless of age and that a forest plan amendment would be required for such harvest to take place. In fact, the Regional Forester's Forest Plan Amendment #2 is not a blanket restriction on commercial harvest of trees greater than 21" DBH. Rather, it presents an analysis process for determining when and where timber harvest (including the harvest of trees >21" DBH) is appropriate to protect and enhance late and old structure while protecting other values, including wildlife. Thus, the Forest to perform this analysis process to determine when and where the selective harvest of trees greater than 21" DBH is appropriate and allowed under the Eastside Screens. *Interim Ecosystem Standard* The Eastside Screens describe a method, the "Interim Ecosystem Standard", to compare current stand structure to the historic range of variability (HRV) and determine which of two scenarios A and B should be followed under the "Interim Wildlife Standard." The Eastside Screens establishes 7 forest structural stages to be used in this HRV analysis. Two of these stages, Multi-Strata with large trees and Single-Stratum with large trees, are considered to be late and old structural stages (LOS). "The primary purpose [of the eastside screens] is to conserve those components of the landscape – old forest abundance [and] wildlife habitat in Late and Old structural stages" (Eastside Forest Plan Amendment No. 2, pg. 5). The DEIS in applying the Interim Ecosystem Standard finds that "scenario A is applicable to all PAGs in the Black Mountain project area" (BM DEIS pg. 46). The DIES also finds that across all vegetation types, multistrata LOS is above HRV and single-stratum LOS is below HRV (BM DEIS pg. 45-46). We agree with the DEIS assessment that Scenario A applies to the Black Mountain project and that single-stratum LOS is below HRV while multi- strata LOS is above HRV.	The ONF appreciates the thorough review of the Regional Forester's Forest Plan Amendment #2 (Eastside Screens) provided by the OFRC. As written, the standards in the Eastside Screens could be interpreted as OFRC described in their comment. However, after the Eastside Screens were issued in 1995, the Pacific Northwest Regional Forester appointed an Eastside Screens Oversight Team and charged the team with reviewing and monitoring Eastside Screens implementation (Powell 2013). The team's objective was to ensure that the Eastside Screens were being applied consistently across all of the Eastside national forests. Additionally, the Oversight Team provided clarification and interpretation of the Eastside Screens by periodically reviewing timber sale projects on each national forest, producing a letter describing their findings, and then circulating the letter to other Eastside national forests. These letters, which are signed by the Regional Forester or the Director of Natural Resources, are considered administrative direction for Eastside Screens implementation and are applicable to all Eastside national forests (Powell 2013). Three letters distributed to Eastside national forests during the Eastside Screens Oversight Team review process provide clarification and additional interpretation of harvest of trees >21 inches diameter at breast height (DBH). The first letter, dated September 25, 1995, was a review of Eastside Screens implementation on the Ochoco National Forest. The letter states: "The Forest is interested in harvesting some trees 21 inch dbh and larger. The screens allow this if the following criteria are met: a. LOS (both single-storied and multi-storied, if both are potentially present) is within or above HRV for the watershed, b. Harvesting the large trees does not cause LOS (of either type) to drop below HRV for the watershed, and c. Sufficient large trees are left to provide snag recruitment at the 100 percent of biological potential level on a stand basis."

Comment Number	Commenter	Comment	Response
		Interim Wildlife Standard The DEIS goes on to state that: "Under Scenario A of the RF Amendment #2, the Interim Wildlife Standard directs that no harvest activities occur within LOS stages that are below HRV, that all live trees 21 inches DBH or larger be maintained, and there be no net loss of LOS." (BM DEIS pg. 46). The DEIS is incorrect that the Interim Wildlife Standard Scenario A directs that "all live trees 21 inches DBH or larger be maintained". The Interim Wildlife Standard addresses restrictions on harvest of trees greater than 21" DBH in two places: in Sec. 6.d.2.a and Sec. 6.d.4.a.1. Generally, Section 6.d provides direction on what to do if at least one type of LOS in your project area is below HRV, aka "Scenario A". The intent is to assure no net loss of LOS. The topics of each subsection are: 6.d.1 – Activities *within* LOS stands 6.d.2 – Activities *outside* LOS stands 6.d.3 – Connectivity Corridors between LOS stands 6.d.4 – Snags 6.d.5—Goshawks The first restriction on harvest of trees greater than 21" DBH comes under subsection 6.d.2 which covers activities *outside* LOS stands. Section 6.d.2 states, "Outside of LOS, many types of timber sale activities are allowed. The intent is still to maintain and/ or enhance LOS… by adhering to the following standards:" 6.d.2.a is the first standard in that section, and it is a blanket prohibition on harvest of trees greater than 21" DBH. Notably, this section does not apply to LOS stands but only to areas "outside of LOS." Activities within LOS stands are covered by section 6.d.1 which reads: Some timber sale activities can occur within LOS stages that are within or above HRV in a manner to maintain or enhance LOS within that biophysical environment. It is allowable to manipulate one type of LOS to move stands into the LOS stage that is deficit if this meets historical conditions. A close reading of 6.d.1 and .2 shows that the prohibition on harvest of trees greater than 21" applies only outside LOS stands. Within LOS stands there is no blanket diameter limit. Timber sale activities are not allowed in LOS stages below HRV (in the case of Black Mountain single-stratum LOS) but, within the LOS stages "within or above HRV" (in the case of black Mountain multi-strata LOS) activities are allowed to either "maintain or enhance" LOS conditions. For the reasons described in this letter, our collaborative recommendations, and the Black Mountain DEIS, we believe that removal of large (>21"), young (less than 150 years) grand fir within 1.5x the dripline of legacy ponderosa pine trees will enhance LOS conditions by improving the health of the large old trees the Eastside Screens are intended to protect.	The second letter, dated October 31, 1995, was a review of Eastside Screens implementation on the Fremont National Forest. The letter states: "Can trees greater than 21 inches dbh be harvested during a treatment to move multi-story to single story LOS? The team responded that, although the standards and guidelines (S&Gs) are not clear in this case, harvest of 21" plus trees is not permitted within non-LOS stands whenever either LOS structural stage (single of multi-layer) is below the historic range of variability (HRV) (Scenario A). The intent is that the same standard should apply to LOS stands as well." The third letter, dated November 14, 1995, was a review of Eastside Screens implementation on the Umatilla National Forest. The letter states: "For additional clarification, the screen direction under Scenario A of the wildlife standard is intended to maintain all live trees >21 inches regardless of tree species and regardless of whether a stand is LOS or not. The existing wording in Scenario A could be erroneously interpreted to mean that large trees >21 inches "could" be cut in LOS in some instances. We regret the ambiguous wording used in writing Amendment #2." The letters referenced above are included in the project record.

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		The second limit on harvest of trees greater than 21" DBH is in section 6.d.4.a which generally covers snags. 6.d.4.a.1 requires that all sale activities "maintain snags and green replacement trees of ≥ 21 dbh… *at 100% potential population levels of primary cavity excavators*." This applies across all stand types both within LOS and outside of LOS. Determination of whether selective harvest of trees greater than 21" is prohibited across all structural stages in the Black Mountain project area hinges on snag abundance and primary cavity excavators. The DEIS conducts an analysis of snag abundance with regards to primary cavity excavators (BM DEIS 189-201). The DEIS points out that current science on wildlife and snags has moved away from biological potential model but that biological potential is standard in the forest plan (DEIS 190). The DEIS cites Thomas 1979 as identifying 2.25 snags per acre as need to meet the 100% biological potential of primary cavity excavators. The DEIS analysis using DecAID snag model finds that in all but 3 snag density classes there are currently more snags on landscape than were historically present (BM DEIS pg. 192). Though the conclusion is not clearly stated, the data presented in the DEIS suggests that the Black Mountain project area is meeting the Forest Plan Amendment No. 2 direction to maintain snags and green tree replacement to meet 100% biological potential of primary cavity excavators. As a result, within multi-strata LOS stands in the Black Mountain project area, harvest of young large (>21" DBH) grand fir and Douglas-fir trees within 1.5 times the dripline of old ponderosa pine, as suggested in our Dry Forest Recommendations, to maintain or enhance LOS is permitted under the Eastside Screens without a Forest Plan Amendment. It is inappropriate to use the Forest Plan Amendment No. 2 to eliminate all the harvest of trees greater than >21" DBH from consideration under an alternative and further study.	
12	22	The ONF should not interpret the Eastside Screens as a simple prohibition on harvest of trees greater than 21" DBH as this does not fulfill the intent of the Eastside Screens. The Eastside Screens allow for harvest of trees greater than 21" DBH within LOS stands within or above HRV that seek to maintain or enhance the LOS habitat while meeting the primary cavity excavator requirement. Allowing the continued risk to old growth ponderosa pine does not meet the intent of the Eastside Screens which were amended in 1995 to address situations like those outlined in the OFRC dry forest agreements. Science supports harvest of young large shade-tolerant/fire-intolerant trees as a reasonable alternative to protect existing old growth and restore historic vegetation conditions (Franklin et al., 2013).	Commercial harvest of trees greater than 21 inches diameter at breast height (DBH) is permitted under Scenario B in the Regional Forester's Amendment #2 (Eastside Screens). Scenario B occurs when the single existing LOS stage (either single or multi-strata) is within or above HRV or if both types of LOS (single and multi-strata) are within or above HRV. Scenario B does not occur in the Black Mountain project area as single-strata LOS is below HRV in the project area, therefore Scenario A applies. Scenario A does not allow harvest of trees >21 inches DBH in LOS or non-LOS. Please refer to comment/response 11.

Comment Number	Commenter	Comment	Response
CUMULATIVE EFFECTS			
13	12; 25	Cumulative effects in the DEIS need to be revised where appropriate to remove the Summit OHV trail project. The US District court has ruled the Ochoco Summit OHV Trail System project cannot proceed and this should be addressed.	The DEIS was released for public comment on December 14, 2018 and included the Ochoco Summit Trails Project in the cumulative effects where appropriate. Due to a U.S. District court ruling in January 2019, the Ochoco Summit Trails Project is no longer moving forward. As such, all references and/or analysis of the Ochoco Summit Trails Project were removed from the Black Mountain EIS between draft and final.
FORESTED VEGETATION			
14	3; 9; 13; 20	The ONF should retain more Douglas fir in all Douglas fir plant associations wherever there is evidence of historic Douglas fir in the form of live old growth Douglas fir, old growth Douglas fir snags and logs, and old growth Douglas fir stumps. Preservation and retention of Douglas fir throughout all plant associations it is found in is recommended as it provides some of the largest and most diverse wildlife habitat in terms of structural diversity, snags, logs, and stumps.	One purpose of the Black Mountain Project is to move towards forest stand compositions that existed historically under frequent low intensity fire regimes. As discussed on pages 7-12 and in the Forested Vegetation section of the FEIS, the abundance of Douglas-fir understories has increased above what occurred historically. The proposed treatments are designed to reduce this abundance and move species compositions towards what occurred historically. Douglas-fir abundance will in general be reduced (although not eliminated) in the Douglas-fir Plant Association Group (PAG). These proposals are consistent with restoration principles contained in *Restoration of Dry Forests in Eastern Oregon* (Franklin et al. 2013).as well as the stand scale recommendations developed by the Ochoco Forest Restoration Collaborative (2017). Appendix A of the FEIS provides additional description of the intent to retain species diversity during commercial and noncommercial thinning activities.
15	3; 9; 13; 20	The ONF should drop the only few acres of commercial logging planned for moist Grand fir and Subalpine fir forest types to be consistent with the purpose and need for the sale of dry forest restoration.	The project proposes to commercially thin up to three acres of forest mapped as subalpine fir plant association group (PAG) and six acres mapped as moist grand fir Plant Association Group (PAG) (FEIS 40). These acres occur as slivers on the edges of larger units. The three acres of subalpine fir PAG are in two units. The six acres of moist grand fir occur on the edges of four units. These isolated areas are surrounded by land mapped as dry forest PAGs and historically experienced disturbance regimes consistent with the surrounding landscape. During project implementation these areas will be evaluated and, based on current stand conditions, may be utilized as leave areas (skips) or the prescription modified to reflect site productivity.
16	3; 7; 9; 20	The ONF should focus any commercial thinning on diversifying existing even age and single tree species plantations and drop planned commercial logging in Late and Old Structure stands (old growth), instead reducing density-related competition stress to old trees by non-commercially thinning small young trees by hand only up to 9-10" dbh and using prescribed burning. This will help preserve old growth habitat structural complexity and ecological integrity for associated wildlife	None of the plantations within the project area are of a sufficient tree size at this time to be suitable for commercial thinning. However, there are 16 plantations within the project area (332 acres total) that are proposed for noncommercial thinning as they are composed primarily of small trees which have not yet reached merchantable size.

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		species and carbon sequestration. Most density from past overstory logging and wild fire suppression is only from small young trees.	As described in the FEIS (p.47–53) multi-strata Late and Old Structure stands (LOS) is above the Historic Range of Variability (HRV) in all Plant Association Groups (PAG) while single strata LOS is below HRV. Harvest is proposed within multi-strata LOS stands to move them to single strata and partially correct this imbalance. This harvest is consistent with the direction contained within the Eastside Screens. Only young trees less than 21 inches diameter at breast height (DBH) are proposed to be harvested. No old trees or trees greater than 21 inches DBH are proposed to be removed.
17	8	The ONF should intensively manage plantations in the Black Mountain project area to provide wood products for future generations. Current forest management practices on the Ochoco do not reflect requirements from the National Forest Management Act (NFMA). If the ONF is not intensively managing its plantations, it is not furnishing a continuous supply of timber, nor is it promoting younger growth that has been part of forest policy from the beginning. AFRC requests that the environmental assessment describes how the proposed action will meet the requirements of NFMA stated above.	The project does propose management of the plantations within the planning area as noted in comment/response 16). Noncommercial thinning in these plantations will remove excess trees and favor the growth of the remaining trees as well as remove trees which are of a less desired species, are of poor vigor, and/or are diseased or damaged. The oldest known plantations in the project area were established in approximately 1982 and are less than 40 years old. They are not at culmination of mean annual increment nor are the trees of a size which would support commercial harvest.
18	13	The ONF should retain mature live trees greater than 15" DBH to preserve adequate habitat in the future for wildlife as these mature trees grow into large and structurally diverse trees that eventually allow for natural snag and downed log habitat recruitment. Large trees better sequester carbon to slow climate change. Larger trees provide shade that helps to retain soil and fuel moisture that will reduce wildfire intensity, helps maintain creek and river flows and cool temperatures critical to aquatic wildlife, and inhibits introduction of invasive species that often require more sunlight and warmer conditions to germinate.	Retaining all trees 15 inches diameter at breast height (DBH) and larger would not meet the need to reduce densities to recommended stocking levels and lower risk of unwanted tree mortality from competition related tree stress. It also would not allow for the removal of young shade tolerant trees (grand fir for example) which have developed in the absence of historic low intensity fire. Removing those trees that are 15-20 inches DBH will move multi-strata stand structures to single-strata stand structures. Multi-strata stand structures which are above the Historic Range of Variability (HRV) levels would be converted to single strata structures which are currently below HRV.
19	8	The ONF should increase the average diameter of trees designated for commercial removal as well as the average volume per acre removed in order to prepare economically viable timber sales. The forest products industry cannot survive (let alone thrive) on enormous volumes of small ponderosa pine and white fir. It is very difficult to create an economically viable product from juvenile ponderosa pine. When average stand diameters for removal of ponderosa pine are less than about 14 inches DBH, economic viability is dubious.	Proposed management activities are designed to be in compliance with the Ochoco National Forest Land and Resource Management Plan, as amended by the Eastside Screens. Objectives of the proposed activities include moving towards historic conditions such as single strata Late and Old Structure as well as reducing the risk of undesired loss from disturbances such as insects, disease, and wildfire. Many harvest activities are focused on the removal of understory trees that have developed in the absence of historic fire regime disturbances and have allowed multi-strata stand conditions to exceed historic ranges of abundance. Other harvest is planned in stands of primarily young trees which are overstocked and in need of density reduction to maintain their health and vigor. Trees up to 20.9 inches DBH would be removed in the Black Mountain project.

Comment Number	Commenter	Comment	Response
20	8	The ONF should not leave conifers of any size when restoring, promoting, and maintaining aspen and hardwood. Forest Service best available science, which is corroborated by the Rocky Mountain Elk Foundation, calls for removing all conifers from these areas. Conifer management in riparian areas and meadows is critical for establishment and growth of desirable shrubs, willows, grasses, and other suitable vegetation for the meadow or riparian area. Please refer to Forest Service General Technical Report, PNW-GTR-806, May 2010, Aspen Biology, Community Classification, and Management in the Blue Mountains.	The General Technical Report (GTR) referenced by the commenter states (page 29): "Although removal of all conifers is most beneficial to aspen, retention of some widely spaced, large conifers for other resource needs is compatible with aspen regeneration. It is likely that aspen in the Blue Mountains historically coexisted with widely spaced large conifers in the parklike stands of old trees that are believed to have dominated here in the past". The treatments proposed in this project would remove conifers that have encroached into hardwood communities. Conifer cutting would take place for an approximate distance of up to one tree height from hardwoods and follow the recommendations contained within the *Aspen Restoration Zones of Agreement* developed by the Ochoco Forest Restoration Collaborative where feasible. 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 (FEIS p. 53-54 and 395).
21	8	The ONF should fully discloses the ecological reasons for wanting to leave trees on the ground in noncommercial hardwood enhancement units and not commercial treating the riparian areas. The proposal in the noncommerciall hardwood enhancement areas is to reduce conifer competition by cutting down and/or girdling conifers that have encroached into hardwood communities and leaving trees on site. It is our belief that merchantable trees, regardless of size and age, can be removed from these areas without causing measurable environmental impacts and by doing so add to the economic viability of the project. This value can be returned to the site to assist in paying for the hardwood and stream enhancement work.	The Black Mountain project includes approximately 97 acres of noncommercial hardwood enhancement in 26 different locations. These units are proposed for noncommercial treatment because they are either: 1) small in size (16 of the units are less than 2 acres); 2) are located in areas where equipment restrictions are in place to protect soil and water resources; and/or 3) do not contain enough merchantable volume to make removal economically feasible. In noncommercial hardwood enhancement units, conifers would be cut down and or girdled and left on site or used as large wood for stream restoration. Merchantable conifers would be harvested within the 27 commercial thinning units known to contain aspen. If currently unknown populations of aspen are encountered in other commercial thinning units the prescriptions adjacent to these aspen would also be modified to remove conifer competition as described on FEIS p.53-54 and 395. Commercial treatments are proposed in Riparian Habitat Conservation Areas (RHCAs) in Alternative 2.
22	10; 26	The ONF should not leave cut trees greater than 21 inches in aspen stands (DEIS p.64), and we suggest this is not advisable. Instead, all merchantable conifer logs should be removed from the aspen stands and slash at least be piled if not burned to reduce fuel load.	Commercial harvest of live trees 21 inches diameter at breast height (DBH) and greater is prohibited by the Ochoco National Forest Land and Resource Management Plan as amended by the Eastside Screens. Please refer to comment/response 20and 21 for additional information regarding removal of conifers from aspen stands. Piling and/or prescribed burning is proposed for all hardwood enhancement units to treat slash generated by the thinning treatments. As noted in the FEIS (p. 53-54 and 395) some of the cut trees may be felled into or towards stream channels to provide in-channel wood and/or to create barriers 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.

Comment Number	Commenter	Comment	Response
23	10	The ONF should include specific actions to protect and enhance Mountain Mahogany. Mountain Mahogany is a valuable food source for both deer and elk and is noted as once present in the project area but at a higher population and wider distribution than currently found (DEIS p222). However, the DEIS does not contain any planned actions to protect and enhance Mountain Mahogany, and we recommend that such actions be written into the Final EIS.	The Black Mountain project includes enhancement and protection of hardwoods found in the project area including mountain mahogany, black cottonwood, bitter cherry, willow, and aspen. Hardwood enhancement would remove conifers that have encroached into hardwood communities, increasing sunlight, nutrients, and water available to hardwoods. Hardwood enhancement would also include planting of hardwoods where they are absent or sparse and installing fencing and individual cages around hardwoods where needed to prevent browsing by ungulates. Please refer to FEIS pages 11-12, 53-54, and 395.
24	20	The ONF fails to disclose that most of the LOS multi-strata condition is caused by very small young trees, not mature trees.	The analysis of Late and Old structure (LOS) conducted for this project and discussed in the Forested Vegetation section of the FEIS concludes that the current amount of multi-strata LOS is above historic abundance levels (HRV). This departure is largely due to the interruption of natural disturbances processes, most notably frequent low intensity fire, which maintained more open single canopy layer conditions. In the absence of disturbance, understories have developed and stand densities have increased. This analysis is focused on stand structure and density, not tree age, and the FEIS does not assert that these understory trees are either young or mature. These trees are however, of a variety of ages as they have been developing for decades since the interruption of the natural fire regimes.
25	20	The ONF should retain all juniper >18 inches DBH and/or showing old growth characteristics, as juniper grows far more slowly in diameter than ponderosa pine, for which the 21" DBH limit was devised based on statistical average size for ponderosa pine >150 years old.	No live trees 21 inches diameter at breast height (DBH) or larger are proposed for commercial harvest as required by the Eastside Screens and all old trees regardless of size (including juniper) are to be retained in both commercial and noncommercial activities as described in the FEIS, Appendix A. The identification of old juniper will utilize the characteristics described in *Western Juniper Management: A Field Guide* (Barrett 2007). The 21 inch DBH limit contained in the Eastside Screens is used to define the definition of a "large" tree and refers entirely to size. The Black Mountain interdisciplinary team is unaware of any scientific study which was utilized during the development of the Eastside Screens to correlate age of ponderosa pine and DBH.
26	20	We are concerned about the planned shift of Douglas fir multi-strata LOS to single strata, as that would generally entail converting these stands artificially almost to monoculture pure Ponderosa pine, ignoring all the field evidence of historic old growth Douglas fir including many large Douglas fir stumps.	The ONF acknowledges the commenters concern. The FEIS (p. 42) references several studies documenting changes in forest compositions from historic conditions and the decreases in ponderosa pine abundance from what occurred historically. The Black Mountain project would restore characteristic (historic) dry forest vegetative conditions, increasing resilience to insects, disease, fire and drought; reducing the risk of high severity fires, enhancing and restoring hardwood communities, and protecting and enhancing wildlife habitat. As discussed on pages 7-12 and in the Forested Vegetation section of the FEIS, the abundance of Douglas-fir understories has increased above

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			what occurred historically. The proposed treatments are designed to reduce this abundance and move species compositions towards what occurred historically. Douglas-fir abundance will in general be reduced (although not eliminated) in the Douglas-fir Plant Association Group (PAG). These proposals are consistent with restoration principles contained in *Restoration of Dry Forests in Eastern Oregon* (Franklin et al. 2013).as well as the stand scale recommendations developed by the Ochoco Forest Restoration Collaborative (2017). Appendix A of the FEIS provides additional description of the intent to retain species diversity during commercial and noncommercial thinning activities.
27	22	We support the use of commercial and non-commercial thinning that reduce stand density while increasing stand diameter. This type of thinning will accelerate development of forests towards the historical range of variation while reducing susceptibility to drought, insects, and uncharacteristically severe fire (Franklin et al., 2013).	Thank you for your comment.
28	20	The ONF should abandon the use of inherently inaccurate models pretending to predict forest structural conditions decades into the future while not accounting for widespread wild fires and insect outbreaks that are likely to be more widespread and intense under extreme climate change. This is a ridiculous exercise (Table 14, DEIS p.49) due to its foreseeable inaccuracy.	Table 14 displays the effect of the proposed activities on the projected amounts of LOS resulting from each alternative. It provides a basis for comparison of effects of the action and no action alternatives and does not, as the commenter notes, include assumptions of unforeseeable future events such as widespread stand replacement wildfire or insect epidemics. Attempting to model such events would be purely speculative as they could occur at an unknown time, at unknown locations, and be of an unknown magnitude. To quantify such events, the FEIS does discuss the current and potential future risk from insects and disease as well as potential fire behavior associated with each alternative. Additional information has been added to the FEIS to clarify why modeling of future widespread wildfire and insect outbreaks is not feasible. Please refer to the Forested Vegetation and Fire and Fuels sections of Chapter 3 for additional information.
29	22	We support the use of thinning to shift tree species composition towards historical composition. In developing our Dry Forest Recommendations, we met with researcher Andrew Merschel whose stand reconstruction work describes the historical species composition and effects of management within dry forest Plant Association Groups (PAGs) on the Ochoco. His research shows that historically, frequent fire kept these forests far more open. Fire-adapted species that thrive in bright sunlight – ponderosa pine and western larch – dominated the landscape. Douglas-fir --which can reproduce in the understory and gain fire tolerance with age – were present but not dominate. Grand fir – a fire intolerant species that do best in shady dense forests that rarely burn – were rare (Merschel et al., 2014). Applied appropriately, thinning can increase the percentage of ponderosa pine and western larch while decreasing the prevalence of shade tolerant Douglas-fir and grand fir.	Thank you for your comment.

Comment Number	Commenter	Comment	Response
30	22	The ONF should use the guide to aging Grand and Douglas fir found in James Johnston's 2018 publication *Restoring historical forest conditions in a diverse inland Pacific Northwest landscape* (Johnston et al., 2018). While researching our Dry Forest Recommendations, we learned that modern researchers such as Jerry Franklin recommend the retention of all old trees regardless of size (Franklin et al., 2013). OFRC's Dry Forest Recommendations codify our agreement to retaining all old trees. We also support the identification of these trees based on guides such as: Identifying Old Trees and Forests in Eastern Washington and Western Juniper Management: A Field Guide (Barrett, 2007; Van Pelt, 2008).	As noted on page 394 of the FEIS, the ONF will base old tree identification on guides *such as* Van Pelt and Barret which does not preclude the use of other guides such as Johnston et al., 2018.
31	22	The ONF should address the four suppression factors identified in the scientific literature and our aspen zones of agreement (Ochoco Forest Restoration Collaborative, 2015; Seager et al., 2015) when treating aspen. We support the prioritization of aspen for active restoration.	Removal of conifers encroaching into hardwood (aspen) sites would follow the recommendations contained within the *Aspen Restoration Zones of Agreement* developed by the Ochoco Forest Restoration Collaborative, where feasible (FEIS 11-12, 53-54, and 395.).
32	22	The ONF should follow a "thin from below" approach and approximate historical conifer density based on site specific evidence (Ochoco Forest Restoration Collaborative, 2015) during removal of young conifers. It is unclear in the DEIS if this is the approach that will be taken with young trees greater than 21" DBH. Young conifers encroaching on hardwood stands compete for light, water, and nutrients; removal of these conifers will improve hardwood health (Ochoco Forest Restoration Collaborative, 2015; Seager et al., 2015). The OFRC also supports the removal of some young conifers >21" DBH with the purpose of enhancing hardwood (aspen) stand health. We ask that the forest fully implement the OFRC's Aspens Zones of Agreement by removing some trees greater than 21" DBH where appropriate to enhance aspen health.	Removal of conifers encroaching into hardwood (aspen) sites would follow the recommendations contained within the *Aspen Restoration Zones of Agreement* developed by the Ochoco Forest Restoration Collaborative, where feasible. In commercial thinning units, young conifers up to 20.9 inches diameter at breast height (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. The text has been modified for clarification (FEIS 11-12, 53-54, and 395).
33	22	The ONF should explicitly plan and quantitatively monitor thinning operations to ensure they move the forest towards historical spatial patterns. Tools such as the ICO marking method ensure that spatial pattern is incorporated in the treatment and monitor the results (Churchill et al., 2017; Franklin et al., 2013; Larson and Churchill, 2012). We support the use of variable density prescriptions that result in a mixture of individual trees, clumps and openings based on historic forest spatial pattern. Restoration of historical spatial pattern is critical to many ecosystem functions including: fire behavior, drought resistance, snow retention, and understory diversity (Churchill et al., 2018).	At this time the ONF is not utilizing the formal ICO methodology developed by Churchill, however, the ONF is incorporating these concepts into the unit specific prescriptions and marking guides. These include requirements for variable densities, retention of individual trees and clumps, and creation of openings or canopy gaps. Prescriptions also take advantage of existing spatial heterogeneity such as retention of all large trees as well as clumps of old trees. Monitoring of this implementation is conducted at the time of marking or, in the case of Designation by Prescription units, at the time of cutting. Monitoring is done by presale crew supervisors, silviculture staff and timber sale administrators.
34	22	The ONF should use site-specific evidence and clues and topographic position to make appropriate adjustments to restoration treatments. (DEIS pg. 399). We support the consideration of site specific evidence to adjust treatments: in the placement of skips and gaps, retention of some conifer within hardwood stands, and adjustments to the target	Thank you for your comment. These suggestions are consistent with the proposed activities contained in the FEIS and follow the guidelines contained in *Restoration of Dry Forests in Eastern Oregon* (Franklin et al. 2013), the stand scale recommendations contained in the *OFRC Dry Forest Restoration Recommendations,* and the *Aspen Restoration Zones of Agreement*.

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		stocking levels/ species composition based on site quality/ topographic position (Hessburg et al., 2015; Larson and Churchill, 2012; Ochoco Forest Restoration Collaborative, 2017, 2015).	
35	12	The ONF should incorporate the concepts and best practices discussed in Lillebo 2012 when conducting treatments.	The document referenced by the commenter (Lillebo 2012) is not a peer reviewed document/publication and is therefore not specifically mentioned or incorporated into the Black Mountain project. However, the concepts outlined by Tim Lillebo while working for Oregon Wild are similar to the guidelines contained in *Restoration of Dry Forests in Eastern Oregon* (Franklin et al. 2013) and the stand scale recommendations contained in the *OFRC Dry Forest Restoration Recommendations* and *Aspen Restoration Zones of Agreement* developed by the Ochoco Forest Restoration Collaborative. Both the guidelines contained in Franklin and the recommendations developed by OFRC would be incorporated into the Black Mountain project (FEIS 18 and 393).
36	11	The ONF should design the project with an optimal mix of treated and untreated patches within and between stands. In order to achieve all the restoration objectives, restoration projects must contain both thinned and unthinned patches.	Vegetation management activities (commercial thinning, noncommercial thinning, noncommercial hardwood enhancement, and prescribed burning) will only occur on 45 percent of the forested areas in the project area, leaving 55 percent of forested areas in the project area untreated (i.e. no change in cover). Variable density prescriptions would result in a mixture of individual trees, small clumps, and leave areas (skips) as well as the creation of small openings (or gaps).
HISTORIC RANGE OF VARIABILITY			
37	12; 25	The ONF should correct the description of historic stand conditions stated in the DEIS. The DEIS (p. 11) states that "Active management of dry forests in the project area with commercial thinning and noncommercial thinning would reduce stand densities, restore a more historic species composition, and create more open, single-story stands, thereby increasing the amount of habitat for species that depend on these vegetation conditions." This description is inconsistent with historic stand descriptions cited by HRV research authors in this section. Rather than a single story stand as stated above (in the DEIS), Churchill et al. (2017) stated that "The historical forest conditions we reconstructed on these plots have all of the characteristics of frequent-fire, open-canopy, old-growth, pine and mixed-conifer forests described by many researchers (Agee 1993; Cooper 1961; Fry and Stephens 2010; Kaufmann et al. 2007; Keen 1940; Larson and Churchill 2012; Sánchez Meador et al. 2009; Weaver 1961)." The authors added that research from Kaufmann et al. (2007) reported that "The strongly clumped spatial patterns, openings, wide distribution of age classes, presence of old trees, and dominance of large-diameter trees are clear evidence of a fine-scale, multicohort, gap-phase replacement system	The information referenced by the commenter is meant to be a brief, simplified description of the proposed action. A detailed description of the Historic Range of Variability (HRV) as well as analysis of how the activities proposed in each alternative would move towards HRV is included in Chapter 3 – Forested Vegetation. A description of proposed management activities, including specific types of treatments designed to meet HRV, are included in Chapter 3 – Forested Vegetation and Appendix A).

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		that has persisted through multiple centuries of frequent disturbance and climatic fluctuation." We are concerned that HRV is mischaracterized as forest stand treatments that are "open, single story stands" when in reality HRV is more complex and should meet the description above.	
38	25	The ONF should not cherry pick and choose what HRV elements to implement and what to leave out which is essentially happening here. Implementation of HRV for forest management should go hand in hand with closing many more miles of project area roads.	The Black Mountain project includes approximately 20 miles of road closure and decommissioning which is consistent with the ONF minimum roads analysis (FEIS 274-279)
39	24; 25	The ONF should not treat Riparian Habitat Conservation Areas (RHCA) to move these areas toward an HRV. Churchill et al. (2007) and other authors evaluating HRV did not have any HRV plots in riparian areas. All the sampling occurred on upland sites; therefore, we question why treatments are proposed in riparian habitat conservation areas (RHCAs) to move these areas toward an HRV. None of the authors analyzing HRV (Churchill et al. 2007, Merschel et al. 2014) indicated that the HRV concept applied to riparian areas.	Riparian Habitat Conservation Areas (RHCA) widths are defined in the Inland Native Fish Strategy (INFISH) as areas adjacent to various classes of streams and wetlands. These distances are based on stream class and include both the lowland/inner vegetation zone and extend into the adjacent uplands. As discussed in the Forested Vegetation and Aquatic Biota sections of Chapter 3 of the FEIS, the upland/outer RHCA vegetation zone experienced frequent low intensity wildfire historically as did the rest of the area outside of the RHCA. The proposed activities would manage towards historic condition within the upland/outer portion of RHCAs. Within the lowland/inner RHCA zone unit specific prescriptions have been developed that would depart from that prescribed in the upland/outer vegetation zone to manage for hardwood enhancement, provision of large wood, maintenance of shade, and other objectives focused towards attainment of Riparian Management Objectives (RMO) and aquatic habitats and not on the Historic Range of Variability (HRV). These include no treatment zones, equipment restriction areas, diameter limits on trees which may be cut, etc. Please refer to the Forested Vegetation and Aquatic Biota sections in Chapter 3 for additional information regarding RHCAs and the upland/out RHCA vegetation zone. Please refer to Appendix E for site specific unit prescriptions in RHCAs and Appendix C for a detailed list of Best Management Practices and Resource Protection Measures designed to reduce impacts to RHCAs.
40	20	The ONF should disclose, analyze, and address recent science from the Pacific Northwest Research Station challenging the use of HRV to return to an assumed static point or range of conditions from the past now that extreme climate change is greatly reshaping future conditions and ecological protection priorities. Historic range of variability was never intended to drive the purpose and need given for timber sales to justify logging being in conflict with many other forest values under the Forest plan such as wildlife species viability, water quality and riparian goals. This science needs to be disclosed, analyzed, and addressed regarding needed changes to forest management policy and direction.	The commenter did not identify or provide references for the recent science referenced in the comment. The ONF is not aware of any recent science refuting the use of Historic Range of Variability (HRV) and review of the Pacific Northwest Research Station website did not identify any recent publications refuting the use of HRV, therefore we are unable to disclose, analyze and address recent science as requested by the commenter. A discussion about climate change is included in the FEIS. Discussion of changes to forest management policy and direction is outside the scope of this project.

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41	20	Given the dynamic nature of forest ecosystems, it is ludicrous to assume that "historically" LOS ranged "between about 7, 363 and 14,463 acres." How could this possibly be known?	Historic ranges of variability (HRV) for each seral/structural stages were developed by an interdisciplinary team utilizing historic information sources such as USGS land survey notes from the 1870's, fire history records, and the 1907 Forest Establishment Report for the Ochoco National Forest. HRVs for each seral/structural stage are expressed as a percentage range for each plant association group. For analysis and discussion purposes, these percentage ranges were converted to acreages in the FEIS.
FIRE AND FUELS			
42	22	We support the use of prescribed fire to increase community safety, reduce risk of uncharacteristic high severity fire, increase forage availability, and increase understory diversity (Fiedler et al., 2010; Metlen and Fiedler, 2006; North et al., 2012).	Thank you for your comment.
43	12	The ONF should more explicitly set forth the various acreages for each of the fuels treatment activities—lop and scatter, hand piling, grapple piling, post-treatment underburning, and underburning only. The Description of Proposed Management Activities in Appendix A fails to provide any specifics about which fuels treatment activities will occur where. It remains unclear whether fuels treatment activities would occur in areas outside of units slated for commercial or non-commercial logging activities—addressing existing conditions—or whether fuels treatment activities are only designed to address the specific impacts of the Project's logging operations. If the latter, the "fuels treatment" activities seem to be more of a solution in search of a problem than a true proposal for moving the Project Area toward desired conditions.	Reduction of activity generated fuels would occur on 6,585 acres in Alternative 2 and 6,105 acres in Alternative 3. Fuels generated in commercial thinning units would be treated with prescribed burning which may include underburning and burning of grapple piles or hand piles. Fuels generated in noncommercial thinning units and noncommercial hardwood enhancement units would be treated with prescribed burning which may include underburning, burning of hand piles, and/or lop and scatter. The majority of fuels created by commercial thinning activities (limbs and tops) are processed and piled at the landing through whole tree yarding techniques to be burned when commercial activities are completed and do not significantly increase surface fuel loading. Reduction of ladder fuels through noncommercial thinning to remove small trees does significantly increase surface fuel loading as discussed in the Fire and Fuels section of the FEIS. These surface fuels would be removed in follow-up treatments with prescribed burning which may include underburning, burning of hand piles, and/or lop and scatter to be decided based on the amount of fuel and funding at the time of implementation. Reduction of *naturally* generated fuels (no vegetation management activities) would occur on 8,596 acres in Alternative 2 and 8,905 in Alternative 3. Naturally generated fuels would be treated with prescribed burning which may include underburning or burning of hand piles. Please refer to Appendix A, Table 3, and Maps 5, 6, 9, and 10 in the FEIS for additional information regarding prescribed burning activities. Additional information has been added to Appendix A to clarify where fuels treatment activities will occur.
44	20	The ONF should cite any science supporting its claim that high severity fires were not common and typically occurred over small areas on DEIS p. 10. In fact, there were many very large landscape scale historical	Citations supporting the claim that high severity fires were not common and typically occurred over small areas have been added to Chapter 1 of the FEIS. Additionally, Chapter 3 - Fire and Fuels discusses historic

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		wild fires that were stand replacing high severity fires before there was widespread or effective wildfire suppression.	fire return intervals for the project area, distribution of severity, and the generally accepted continuum or overlap of fire regimes (Figure 6). The Fire and Fuels section also cites studies discussing high severity fire in dry mixed conifer and ponderosa pine forests including Odion, et al. (2014) which suggests an average return interval of moderate severity fire every 235 years and high severity fire rotations of 849 years for the Blue Mountains and Heyerdahl, Loehman, and Falk (2019) which found little evidence for extensive high-severity fires in the Ochocos and eastern Oregon.
45	20	The ONF should disclose that there is no significant evidence that fuel reduction logging actually reduces the incidence, severity, or extent of wild fires or that most fires are primarily driven by weather conditions, not "fuel" loading.	In the FEIS, the Fire Behavior analysis in Chapter 3 – Fire and Fuels discusses the effects of thinning as well as referencing a synthesis of the Theory and Practice of Wildland Fuels Management (Omi 2015) which in turn references numerous studies on the effectiveness of fuels treatments in reducing wildfire severity especially when mechanical treatments and prescribed fire are used in combination. The fire and fuels report discusses the frequency of natural ignitions in the project area and discrepancy between historical fire regime and recent fire occurrence as well as disclosing the fine fuel increase, increased wind speeds, and facilitated spread of surface fire. Additionally, fire behavior modeling incorporates sever weather conditions. Please refer to the Fire and Fuels section in the FEIS.
SOILS			
46	17; 18	We express concern about cumulative effects of roads, timber harvest, and thinning practices that will impact soils. Proposed scarification, ripping, and subsoiling does not assuage the negative impacts compaction of soil.	We acknowledge the commenters concern. Please refer to Chapter 3 – Soils for a detailed discussion of effects to soils and Appendix C for a detailed list of Best Management Practices and Resource Protection Measures designed to reduce impacts to soils.
47	11; 20	The ONF is violating the Forest Plan standards for detrimental soil impact. 265 units would remain above the 20 percent threshold after implementation and thus violate the Forest Plan standard.	The Region 6 Supplement 2500.98-1 clarifies direction for planning and implementing activities in areas where soil quality standards are exceeded from prior activities; re-defines soil displacement; and provides guidance for managing soil organic matter and moisture regimes. The Region 6 Supplement includes policy for activities in areas where soil quality standards (20 percent detrimental soil conditions) are exceeded. The policy states when initiating new activities: • 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.

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			Detrimental soil conditions in the Black Mountain project area after implementation of proposed activities would be consistent with this policy and therefore not in violation of Forest Plan standards.
HYDROLOGY			
General			
48	21	We appreciate the DEIS's thorough analysis of the water quality issues related to sediment delivery and stream temperature. We agree with the conclusion that sediment delivery is expected to increase in the short-term and decrease in the long-term, relative to existing conditions and the No Action Alternative. We also agree with the anticipation of beneficial effects to shade and stream temperature due to increased stream stability and hydrologic function, as well as the caveat that attributing long-term stream temperature measurements specifically to the Black Mountain project would be unlikely.	Thank you for your comment.
Peak Flow			
49	12	The ONF should correct the statement at page 97 that roads have a minimal effect on sedimentation. The document states, at page 97, that "The current harvest road and trail network within the watershed is limited mostly to routes with minimal hydrologic connectivity and the network receives periodic maintenance and reconstruction to ensure proper drainage." Much of these legacy roads are the main roads in the project area and are typically along streams and in RHCAs. These roads are essentially still being used, so this statement at page 97 that these roads have a minimal effect on sedimentation and turbidity is highly suspect.	The current road and trail network referenced by the commenter is specific to roads and trails used for harvest (harvest network) as part of the Black Mountain project and does not include every system or non-system road in the project area.
50	12	The ONF should explain why they want to increase potential peak flows by putting treatments close to stream channels. Page 100 states "The potential for increased peak flows can be amplified if treated units occur directly adjacent to, or in close enough proximity to stream channels (like RHCAs) where a direct hydrologic connection of surface runoff from the unit to the channel is created. Approximately 40 percent of the RHCA within the Black Mountain project would be treated in close proximity to stream channels where there would be a hydrologic response." It is unclear why the ONF would want to increase the potential for peak flows by putting treatments close to stream channels.	The peak flow analysis has been edited for clarity and accuracy. Please refer to pages 96-101 of the FEIS. Please refer to comment/response 72-76 for additional information regarding treatments in Riparian Habitat Conservation Areas (RHCAs).
51	20	The ONF appears to be increasing the ECA (or now EHA) threshold for hydrological effects arbitrarily as forest are increasingly degraded by logging but more logging is desired by the federal government and now the effects threshold is mysteriously raised to 30% to allow for further impacts beyond the 24% EHA existing condition. Are ECA and EHA	Equivalent Harvest Area (EHA) is an assessment that has been required by the Ochoco National Forest (ONF) Land and Resource Management Plan (LRMP) since 1989. Each watershed in the ONF was given an EHA sensitivity rating and threshold value during development of the LRMP. The North Fork Crooked River watershed

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		determined the same way, or not? When did ECA become EHA and the threshold go up to 30% in the science?	has a Medium *sensitivity rating* which equates to a 30% (EHA) *threshold value* and has remained at this value since it was established (USFS 1989).
Sediment			
52	12; 24	The ONF should perform a sediment budget for the Black Mountain project. The DEIS states that "Performing [a sediment budget] such measurements and modeling is impractical and beyond the scope of this Project, therefore the sediment budget for the Upper North Fork Crooked River is unknown. Since the sediment budget accounting is impractical, it is discussed in theory." (DEIS at 102) Sediment measurements and budgets are not impractical, as proven by the Summit OHV Project, where the ONF estimated current sediment yields in the Upper North Fork Crooked River watershed of 2,515 tons of sediment per year, with Peterson and Porter Creek watersheds of 1,080 and 583 tons/year respectively.	The Black Mountain project does not tier to, nor rely on the analysis completed in 2017 for the Ochoco Summit Trails Project. Upon review of public comments and further review of the Black Mountain Hydrology report, the responsible official decided to reanalyze sediment yield for the Black Mountain project. The updated sediment yields are included in the FEIS. However, sediment yields in the Black Mountain project area are only calculated for areas of disturbance (i.e. units and roads) within 300 feet of stream channels (sediment delivery zone) and not for the entire Upper North Fork Crooked River watershed as they were in the Ochoco Summit Trails Project because this boundary includes the only areas that would experience ground disturbance as a result of Black Mountain project activities and thereby the only areas that could potentially effect sediment delivery in this project. Therefore the tons of sediment per year calculated in Black Mountain will not be the same as the tons of sediment per year calculated for the Ochoco Summit Trails Project. The sediment delivery analysis has been edited for clarity and accuracy. Please refer to pages 102-112 of the FEIS. A description of the model (Water Erosion Prediction Project) and the associated assumptions used for the Black Mountain analysis are located in the project record and available upon request.
53	12; 24	The ONF should support its sediment estimates with data and transparent analysis. The DEIS asserts that: "However in-channel sediment due to streambank instability such as channel scour, stream bank sloughing, headcuts, and high embeddedness have been documented in recent Level II stream surveys and observed by Forest Service hydrologists and soils scientists. It is estimated that most of the sediment transport in the sediment budget is coming from in channel erosion such as cutbanks, headcuts, and scour with a total of at least 25 tons of sediment per year in the project area, of which, greater than 1 ton/yr. of sediment is factored in as eroded from the impaired sites identified as needing restoration in the project area." (DEIS at 105). Clearly sediment is coming from both degraded channels as well as upstream sources outside of the RHCAs. However, the estimate of 25 tons/year is not supported by any data or transparent analysis, and is inconsistent with the sediment estimates from the Summit OHV Project.	Please see comment/response 52.
54	12	The ONF should use 300-foot buffers to protect streams. Generally, 300-foot buffers from disturbance are recommended for perennial streams and have long been held as the standard for stream protection. The Summit OHV SFEIS stated, at page 138, that "Studies have	The Black Mountain project does not tier to, nor rely on the analysis completed in 2017 for the Ochoco Summit Trails Project. Studies of vegetative stream buffer effectiveness have shown varying results but have generally concluded that buffers of 30-300 feet are effective in

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		generally concluded that non-channelized sediment flow rarely travels more than 300 feet and that 200-300 foot riparian 'filter strips' are generally effective at protecting streams from sediment from non-channelized flow (INFISH 1995, Belt et al. 1992)." At page 106, the Black Mountain DEIS states that "The spatial boundary for analyzing the direct and indirect effects to sediment and turbidity is 200 feet from Riparian Habitat Conservation Areas (RHCA) Class I-IV streams referred to as the Sediment Delivery Zone (SDZ). This boundary is used because the SDZ encompasses the dominant sediment contributing area for the project". It is unclear why the Black Mountain Project is using 200 feet as a protection zone.	reducing sediment delivery under most harvest and road building activities (Broderson 1973, Lynch et al. 1983, Clinnic 1985, Heade 1990, Belt et al. 1992, Rashin et al. 2006). The range (30-300 feet) varies based on the type of ground disturbance, slope, climate, soil type, buffer composition, and whether sediment is channelized or non-channelized. In the Draft Environmental Impact Statement (DEIS), 200 feet was selected for the sediment delivery zone (SDZ) for the Black Mount project area because of the scab stringer landscape, the quantity of gentle "rolling" terrain and low angle slopes, and non-channelized nature of the sediment delivery. Upon review of public comments and further review of the Black Mountain Hydrology report, the responsible official decided to reanalyze sediment yield for the Black Mountain project. The updated sediment yields were analyzed with a 300 foot SDZ as requested by the commenter. The sediment delivery analysis has been edited for clarity and accuracy. Please refer to pages 102-112 of the FEIS. A description of the model (Water Erosion Prediction Project) and the associated assumptions used for the Black Mountain analysis are located in the project record and available upon request.
55	12; 24; 25	The ONF should provide evidence to support that a substantial amount of recovery has occurred since legacy livestock grazing occurred. The DEIS (p. 103) claims that "Legacy livestock grazing compacted soils, greatly reduced vegetative groundcover and denuded whole areas of the landscape resulting in increased runoff and erosion. There has been a substantial amount of recovery since the legacy impacts of beaver trapping and historic grazing, but erosion rates and sediment delivery is still elevated, but not as much as it once was." While the impacts from legacy and ongoing livestock grazing continue, there is no evidence or data to support that a "substantial" amount of recovery has occurred.	The historic legacy impacts referenced are from the 1880s to the 1930s approximately. The sediment delivery analysis has been edited for clarity and accuracy. The statement referenced by the commenter has been removed because the updated analysis provides more accurate information on sediment levels. Please refer to pages 102-112 of the FEIS.
56	12; 25	The ONF should verify statements made in the DEIS that contradict the Summit OHV project regarding the harvest network and hydrologically connected roads. The DEIS (p. 103) reported that "The poorly placed harvest network [of roads] of the past that is hydrologically connected is in passive recovery. The current harvest road and trail network within the watershed uses less routes that are hydrologically connected, to the extent practicable." This contradicts some of the data from the Summit OHV project documents which showed very high road densities and poor sediment loads and regimes in these same subwatersheds.	The Black Mountain project does not tier to, nor rely on the analysis completed in 2017 for the Ochoco Summit Trails Project. The sediment delivery analysis has been edited for clarity and accuracy. The statements referenced by the commenter have been removed. Please refer to pages 102-112 of the FEIS.
57	12; 25	The ONF should provide evidence to support the following statement on page 108 that "It is estimated that 10% of a treatment unit's area would become disturbed by these processes [harvest]. Only a portion of this acreage is expected to contribute to sediment delivery. The duration of the disturbance would be for the length of time the timber sale unit is open to operations." 10% is an arbitrary estimate with no basis of fact,	This estimate is based on calculating the area affected by skid trails. Primary skid trails are generally spaced 100 feet apart approximately 10 feet in width equating to approximately 10% of a unit's area to minimize soil displacement and compaction. Best Management Practices (BMP) and Resource Protection Measures (RPMs) designed to reduce the effects from skid trails would be implemented in the Riparian Habitat

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		and the statement that disturbance only occurs during operations is disingenuous. There appears to be no basis for this estimate of 10%, and the statement that disturbance only occurs during operations is not borne out by studies. Many studies have shown timber harvest and high road densities increase sediment delivery, not just for the life of the Project but for many years after operations have ceased. Research studies have well documented that timber harvest and high road densities increase sediment delivery, not just for the life of the project but for many years and even decades after operations have ceased.	Conservation Areas (RHCA) and the Sediment Delivery Zone (SDZ). Please refer to Appendix C for a detailed list of BMPs and RPMs and Appendix E for unit specific prescriptions in RHCAs. The sediment delivery analysis has been edited for clarity and accuracy. Please refer to pages 102-112 of the FEIS.
58	20	The ONF should justify the assumption that a 62-76% increase in sediment delivery in the "short-term" would somehow translate to a 48% long-term decrease from the existing condition. A 62-76% increase in sediment delivery seems like a significant increase that would not decrease readily to 48% unless "long-term" is an exceedingly long term or natural recovery is typically that great.	Sediment yield modeling estimates a 53 percent increase in sediment delivery for 1-3 years (short-term) during project implementation in Alternative 2 and 55 percent in Alternative 3. This is largely attributed to haul route traffic, new temporary roads, and existing temporary roads. Post implementation (>3 years), sediment delivery is estimated to decrease by 57 percent in Alternative 2 and 56% in Alternative 3. This is attributed to closed, roads, decommissioned roads, and road maintenance. The sediment delivery analysis has been edited for clarity and accuracy. Please refer to pages 102-112 of the FEIS.
59	12; 24; 25	The ONF should support the assumption that "The duration of the rehabilitation would occur while the timber sale unit is open to operations and extend after the timber unit is closed until slash piles are burned and the ground under the slash piles are re-seeded and revegetated. The 48% long term decrease in sediment delivery is attributable to these activities" as stated in the DEIS. There is no data or study to explain the notion that there will be a 48% decrease in sediment delivery from rehabilitation activities.	Please see comment/response 58.
60	12; 24; 25	The ONF should use accurate baseline data to avoid arbitrary conclusions like those found on p. 109 of the DEIS. The DEIS claims that "After timber operations conclude, the maintained or reconstructed roads would have functional drainage and would receive mostly light traffic resulting in dispersed runoff, reduced erosion, and decreased sediment delivery for reasons stated above about improving drainage. Sediment delivery on project roads would be reduced to <1 tons which is 80% less than the existing condition." The DEIS conclusion is that sediment delivery will be reduced for all action alternatives compared to the no action alternative. That is a highly speculative amount of reduced sediment determined after creating roads, removing trees, and claiming road closures that are ineffective.	Upon review of public comments and further review of the Black Mountain Hydrology report, the responsible official decided to reanalyze sediment yield for the Black Mountain project. The updated sediment yields are included in the FEIS. Sediment yield modeling estimates a 53 percent increase in sediment delivery for 1-3 years (short-term) during project implementation in Alternative 2 and 55 percent in Alternative 3. This is largely attributed to haul route traffic, new temporary roads, and existing temporary roads. Post implementation (>3 years), sediment delivery is estimated to decrease by 57 percent in Alternative 2 and 56% in Alternative 3. This is attributed to closed, roads, decommissioned roads, and road maintenance. The sediment delivery analysis has been edited for clarity and accuracy. Please refer to pages 102-112 of the FEIS. A detailed description of the model used for this analysis is included in the project record.
61	23	The ONF claims that sediment levels will decrease to below pre-project levels 10 or more years after implementation. This speculative claim seems to be based primarily on the idea that removing conifers will allow herbaceous understory to establish and increase infiltration.	Please see comment/response 60.

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		However, logging conifers will not address the primary issues that created and continue to exacerbate negative alterations of watershed hydrology, increased sedimentation, and other related problems.	
62	12	The ONF repeatedly asserts that the action alternatives will produce less sediment than the no action alternative. The ONF states that there may be short term increases from roads, harvest and restoration activities but overall there will be less sediment production than the existing condition. It is impossible to reconcile that action alternatives 2 and 3, with over 15,000 acres out of the roughly 34,000-acre Project area treated with harvest and thinning, nearly 9,000 acres of burning, reconstructing roads on over 23 miles, and constructing almost 24 miles of temporary roads, will cause sediment to decline, streambanks to be restored, and riparian areas and fish habitat to improve.	Please see comment/response 60.
Shade/Temperature			
63	23; 25	The ONF should add stream temperature data to the DEIS.	Stream temperature data is located in the Black Mountain project record and is available upon request.
64	12; 23	The ONF should not contribute to shade removal on streams that already fail to meet INFISH standards. Both action alternatives have a significant amount of shade removal on streams that already fail to meet INFISH standards. The INFISH standard for forested streams is 80% shade. While shade removal in both action alternatives is considered a short-term impact of less than 5 years, it puts those streams with significant degradation at risk for potentially decreasing bank stability and shade, and increasing already high summer water temperatures during summer low flows.	No significant amount of shade removal would occur in the Black Mountain Project. Activities resulting in the reduction of vegetation within the Potential Shade Zone (PSZ) would be spatially intermittent and would not be expected to measurably decrease effective shade or increase water temperatures. Long-term, it is anticipated that shade would increase over the next 5-10 years due to increased vigor of residual riparian trees, shrubs, and grasses once some of the conifer canopy and understory is removed and/or consumed via implementation activities (noncommercial thinning and prescribed burning within RHCAs). Increased shade from the hardwoods would lead to incrementally lower temperatures in streams long-term (>5-10 years) which is a critical element fish need for safe survival during low flow periods when water temperatures increase in the summer months. A minor localized amount of shade would be reduced short-term (<5 years), but no measurable increase in water temperatures resulting from these activities is anticipated (FEIS 113-117). The Black Mountain project interdisciplinary team carefully evaluated each stream and site specific prescriptions were developed based on slope, aspect, stream condition, soil conditions, existing vegetation, large woody material, and PSZ. For class I, II and III streams, efforts were made to ensure that activities did not occur or activities were minimal within the PSZ of live water reaches. Please refer to Appendix E for unit specific prescriptions.
65	12; 23	The ONF should forego any harvest or thinning RHCAs in order to make positive progress towards reaching the shade standards of INFISH. The DEIS states on page 128 that “Data from R6 Level II stream surveys	Please see comment/response 64.

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		conducted over the last 25 years show that out of 134 shade measurements in reaches across Allen Creek, Porter Creek, Dry Porter Creek, East Porter Creek, and the North Fork Crooked River, only 43 met or exceeded the 80% threshold for desired conditions." Essentially, barely one-third of the streams have met the required shade standard, 30 years after the LRMP was implemented. This failure should not be exacerbated by the actions of the Project, but rather the Project should forego any harvest or thinning in RHCAs in order to make positive progress towards reaching the shade standards of INFISH.	
66	23	The ONF gives no clear rationale or justification to support their assertion that stream temperature increases would not occur or would remain localized and not meaningful, especially given the large acreage of logging proposed in RHCAs.	Please see comment/response 64.
67	12	The ONF should correct the statement that "80 percent shade is most likely an unattainable provision." The DEIS at page 114, states that INFISH shade standards for many streams in the Project area are already not being met: "Synthesis of shade measurements from R6 Level II stream surveys conducted over the last 25 years in reaches across Allen Creek, Porter Creek, Dry Porter Creek, East Porter Creek, and the North Fork Crooked River, indicates 80 percent [shade] is most likely an unattainable provision for this project area in the existing condition."	The statement that 80% shade is unattainable in the existing condition is correct. This is due to several factors which include stream aspect/orientation, the density and height of surrounding vegetation, the width and depth of a stream, and/or volume of water present during critical times (FEIS 112).
68	12	The DEIS also justifies not meeting the 80% standard for the shade requirement because they are "north-south facing streams", but these are actually better situated for shade from vegetation and topography compared to east-west streams.	Synthesis of shade measurements from R6 Level II stream surveys conducted over the last 25 years in reaches across Allen Creek, Porter Creek, Dry Porter Creek, East Porter Creek, and the North Fork Crooked River, indicates 80 percent is most likely an unattainable provision for this project area in the existing condition. This is due to several factors which include stream aspect/orientation, the density and height of surrounding vegetation, the width and depth of a stream, and/or volume of water present during critical times. The text has been edited for clarity. Please refer to page 112 of the FEIS.
AQUATICS			
General			
69	12; 24	The ONF repeatedly concludes in its analyses that these overstocked conifer stands along streambanks are degrading fish habitat and this habitat will continue to decline unless the ONF actively treats the overstock stands in the uplands and along streams. While "legacy" fire suppression, timber harvest, and livestock grazing is acknowledged as a contributing factor for poor stream health and fish populations, the analyses in the DEIS largely claim that the current degradation is ongoing due to changes in forest stand composition and density. This	Degradation in streams and aquatic habitat is attributed to multiple factors, including past fire suppression, road building, past harvest practices, and legacy livestock grazing, all of which have contributed to current forest stand composition and densities near streambanks. Please refer to the Chapter 1 – Purpose and Need and the Forested Vegetation, Hydrology, and Aquatic Biota sections in Chapter 3.

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		claim is not supported in the literature. In fact, much of the stream degradation is directly attributable to high road densities and past and present livestock grazing.	
Sensitive Species			
70	3; 9; 20; 23	We are concerned by potential timber sale impacts to the following species in particular: Sensitive Redband trout and Sensitive Columbia Spotted frog from planned logging within RHCA buffers.	We acknowledge the commenter's concern. Please refer to Chapter 3 – Aquatic Biota for a detailed discussion of effects to redband trout and Columbia spotted frog. Please refer to Appendix C for a complete list of Best Management Practices (BMP) and Resource Protection Measures (RPM) designed to protect and reduce effects to Riparian Habitat Conservation Areas (RHCA) and Appendix E for unit specific prescriptions designed to protect and reduce effects to RHCAs.
71	25	The ONF should acknowledge the importance of redband trout and conserve redband trout as an Oregon Department of Fish and Wildlife Oregon Conservation Strategy (OCS) species, or acknowledge that the Blue Mountain BM-04 Conservation Opportunity Area as an important strategy habitat to be conserved and protected (ODFW 2006, 2016). Planning and implementation of the Black Mountain project must be consistent with protection and restoration of key strategy species and habitats in the North Fork Crooked River and Big Summit areas.	Redband trout are acknowledged and analyzed as both a Forest Service Management Indicator Species (MIS) and a Region 6 Sensitive Species. The ONF coordinates with the Oregon Department of Wildlife (ODFW) on all vegetation management projects and matters pertaining to redband trout within and outside the project area. The Black Mountain project includes 7.7 miles of stream restoration designed to improve habitat for redband trout and in all commercial and noncommercial thinning units, trees would be felled in/towards streams to improve stream conditions and habitat. Please refer to Appendix C for a complete list of Best Management Practices (BMP) and Resource Protection Measures (RPM) designed to protect and reduce effects to Riparian Habitat Conservation Areas (RHCA) and aquatic habitat and Appendix E for unit specific prescriptions designed to protect and reduce effects to RHCAs and aquatic habitat.
72	24	The DEIS (p. 125) states: "According to Stuart et al. 1996, in the Blue Mountains, redband trout might be extirpated from streams with the poorest habitat quality and highest disturbance. However, since these stream systems are well connected to one another, at least seasonally, colonization could readily ensue from other basins, with rearing environments that are more stable and of higher quality and capacity." These headwater streams, such as Allen Creek, Peterson Creek and Beetle Creek and tributaries, flow directly into private property on the Big Summit Prairie. Aquatic habitat on the Prairie has been severely altered from a viable prairie with functioning meadows and stream channels that connect to the North Fork Crooked River. Activities on the Prairie have favored high livestock grazing and impacts of private recreation events, such as the Solar Eclipse event in August 2017 with over 50,000 participants, by the landowner and has removed vegetation and increased compaction. Fish and other aquatic species are more isolated as they are restricted in passing downstream below the Prairie. The deteriorated condition of streams on private land that flow out of the Prairie has high temperatures and poor water quality that flows directly	The text referenced by the commenter has been edited for clarity (FEIS 123). Forest Service direction regarding management of fish populations, including Region 6 sensitive species such as redband trout, is to ensure regional-scale population viability and persistence rather than viability at the watershed, project, streams, or segment of stream scale. An example of the regional-scale is the Middle Columbia River Basin.

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		into the North Fork Crooked River. Allen Creek and Peterson are also blocked by dams on private land on the Big Summit Prairie. Therefore, fish that pass downstream are unable to move back upstream since there is no passage, further depleting these populations. The DEIS statement above that "these streams are seasonally well connected" and "colonization could readily ensure from other basins" is false. Because these streams that enter the Prairie are not connected to other basins, the risk of redband trout being extirpated in this area increases dramatically because fish are unable to recolonize. Therefore, these disconnected populations are at high risk of extinction from small population sizes, degraded habitats, and extreme climate events.	
Pool Quantity and Quality			
73	12	The ONF should provide adequate baseline of environmental conditions and must include and consider all data and information available. Where accurate information is not available, it must collect updated information. The data presented in tables 42 and 45 (pages 137-138, 144) are habitat parameters considered important for fish habitat and are intended to show the quality of stream habitat (or the lack thereof). The DEIS states on page 122 that "While all data sources are the most current available, it is recognized that these data are not entirely reflective of current management given the age of some of the surveys. All available data were used to characterize the Project area. The best available data at the time of the analysis were used in this Project." There are two problems with this statement. First, the DEIS does not include all the data available. Second, in the several intervening years since this Project was initiated and scoped, additional data could have been collected and was not.	The Ochoco National Forest conducts stream inventories on an annual basis to the degree that funding and associated workforce capacity allow. All available data (1991-2017) were used to depict baseline conditions in the project area. The data used to depict baseline conditions is adequate because there has been no large projects, disturbances, or events in the project area that would cause any sort of drastic change to those baseline conditions.
Riparian Habitat Conservation Areas			
74	20; 23; 24; 25	Commercial harvest activities to extract trees for a timber sale that include building roads, temporary roads, skid trails and compaction of heavy equipment within RHCAs does not meet INFISH (1995) for Timber Management and Roads Management. Removing trees for commercial harvest from RHCAs in streams deficient of large wood does not meet INFISH (1995). The activities within the RHCAs would retard and prevent attainment of other Riparian Management Objectives.	INFISH does not preclude land management activities (including commercial harvest) in a watershed or Riparian Habitat Conservation Area (RHCA) where streams are not meeting Riparian Management Objectives (RMO). The activities proposed in RHCAs would not further retard or prevent attainment of RMOs. Please refer to pages 54-57 and 145-150 in the FEIS for a detailed discussion of potential effects to RHCAs, Appendix C for a complete list of Best Management Practices (BMP) and Resource Protection Measures (RPM) designed to protect and reduce effects to RHCAs and Appendix E for unit specific prescriptions designed to protect and reduce effects to RHCAs.
75	19	The ONF should use Alternative 2 for Class 3 and 4 streams, but Alternative 3 for Class 1 and 2 streams. Given that riparian areas are sensitive and important to the overall health of the forest, we prefer options that have minimal impacts on them and yet achieve the desired	Please see comment/response 74.

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		restoration of historical species ranges and variability, including encouraging hardwoods in riparian areas. The treatments for riparian areas described in Alternative 2 will have a stronger effect in this direction, and we can agree with using them for stream classes 3 and 4. As stream classes 1 and 2 retain more riparian characteristics, we prefer using noncommercial treatments on them and recommend you use Alternative 3 for these stream classes.	
76	23	The ONF should explain how it intends to move forward with commercial logging in RHCAs, given that many streams within the project area are currently not meeting stream temperature RMOs or state water quality standards.	Please see comment/response 74.
77	23	The ONF is violating NEPA regarding the potential harvest of larger commercial sized trees adjacent to and in RHCAs. It is one thing for the public to comment on proposed logging adjacent to RHCAs that might provide some trees for placement into creeks; it is another thing entirely for those trees to be sold and not provide any benefit to the forest.	Please see comment/response 74.
78	19	The ONF should include direction for work in riparian areas to be scheduled to minimize damage to soil surfaces and plants and to stream banks, that is, when soil is not saturated with meltwater or rain. We do not find this direction in the document.	Please refer to Appendix C for a complete list of Best Management Practices (BMP) and Resource Protection Measures (RPM) designed to protect and reduce effects to Riparian Habitat Conservation Areas (RHCA) and Appendix E for unit specific prescriptions designed to protect and reduce effects to RHCAs.
79	19	Some use of fencing to protect riparian areas is discussed (p. 403). The construction described is not as wildlife friendly as more current designs, in particular that the construction uses a barbed top wire. We recommend and encourage using the Livestock Containment fencing referenced here: https://www.thinkwildco.org/fencing.html and for Areas with Livestock and Wildlife pressure here: https://efotg.sc.egov.usda.gov/references/Public/OR/382AAjs_OR_WildlifeFriendlyFence_4-15-10.pdf. To reduce injuries it is important to use smooth wire for both the top and bottom strands.	The resource referenced by the commenter states “where feasible, use smooth wire for the top and bottom wires to reduce injuries.” Exclosures in the Black Mountain project would be constructed as a four-strand wildlife friendly fence. This would include three strands of barbed-wire and one strand of smooth wire on the bottom. Barbed-wire is used on the top strand as observations from ONF range resource specialists indicate smooth wire on the top does not effectively deter livestock.
80	25	The ONF should correct the assertion that fire exclusion continues to suppress riparian vegetation. The DEIS (p. 148) states “Ongoing management practices like fire exclusion and grazing have contributed to species compositions within the overall RHCA, becoming dominated by dense, single-aged stands of conifers, which shade out hardwood and/or herbaceous riparian vegetation, reducing the availability of complex and resilient riparian habitats necessary for redband trout, Columbia spotted frog, and other aquatic biota.” While we agree that livestock grazing has and continues to suppress riparian vegetation, the assertion that fire exclusion does the same thing is not supported. In fact, we note that Merschel et al. (2014) reported that livestock grazing contributed to the change in forest composition along with logging large diameter trees over the past century: “The wave of tree establishment that began in 1900 that we documented in mixed-conifer forests was	The assertion that fire exclusion has contributed to current Riparian Habitat Conservation Areas (RHCA) vegetation conditions is inclusive of the recognition that fire exclusion has contributed to a change in fire regimes, which, as stated by the commenter, are noted to affect composition in Merschel et al. 2014.

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		likely caused by a variety of factors, including changes in fire regimes, selective tree harvesting, and domestic livestock grazing."	
81	29	The ONF should select Alternative 2. We agree that prescriptions within riparian areas should be developed with the objective to restore the nat-ural range of variability and improve stream channel function and stability as outlined in Appendix E. We recognize that there will be short-term impacts as a result of these treatments but the long-term benefits will far outweigh the short-term effects. To not treat the riparian corridors will only lead to further degradation of the stream channel and riparian habitat. Further analysis shows that any short term impacts will be mitigated by substantially more long-term benefit. See Table 4, Comparison of Effects by Alternative. Our experience leads us to believe that to not complete treatments within RHCAs (riparian corridors) would lead to exacerbated violations of water quality through time as stream banks continued to become unstable, hardwoods continue to decline, and RHCAs remain susceptible to uncharacteristically intense fire. For the reasons stated above, we would like Alternative 2 selected where commercial thinning would take place within RHCAs according to tables 138 and 139 in Appendix E.	Thank you for your comment.
82	23	The ONF is violating PACFISH/INFISH because it has failed to monitor RMOs for stream undercut banks (lower bank angle) within the project area.	The Riparian Management Objective (RMO) for lower bank angle is only applicable to *non*-forested systems (USFS 1995a). The Black Mountain project is in a forested system; therefore, the lower bank angle RMO is not applicable to the Riparian Habitat Conservation Areas (RHCA) in the project area.
Stream Restoration			
83	12	The ONF should clarify what activities are included in stream restoration. At page 74, the DEIS describes the single action of placing large woody debris in streams "Each action alternative proposes 7.7 miles of stream restoration. Actions associated with this include removing trees from the areas surrounding the stream (575 acres identified) and placing them in the channel to increase amounts of large woody debris." Essentially, the majority of "stream restoration" consists of removing trees in the RHCAs and putting them instream as LWD (large woody debris). Later, on page 101, the DEIS contradicts this statement by saying that "Stream restoration would lessen potential adverse effects of increased peak flows on a localized scale on 7.7 miles of stream by restoring floodplain access." Do stream restoration activities consist solely of removing trees from RHCAs and putting them instream as LWD? Or will other activities that "restore[e] floodplain access" occur? The DEIS must clarify this point.	Stream restoration activities would include in-stream work such as channel reconstruction, placement of stream structures such as large woody debris, beaver dam analogues and/or rocks, filling gullies and incised channels, planting native riparian vegetation, and fencing/caging. Approximately 1500 trees (large woody debris) may be collected from riparian units adjacent to the stream restoration or from upland large wood source units and transported to restoration sites. Planting and seeding would occur in disturbed areas and riparian protection fencing and caging would be used to protect and accelerate recovery. Additional restoration activities include culvert replacement, riparian protection fencing, and riparian pasture creation.
84	12	LandWatch renews its request for a stream restoration plan that provides a robust and detailed description of the restoration plan that is spatially and temporally explicit.	Please refer to pages 397-398 in the FEIS and Maps 11 and 12 for a detailed description of stream restoration activities.

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WILDLIFE			
Miscellaneous			
85	19	The ONF should schedule work to avoid calving times, nesting times and trees, and other sensitive periods for the wildlife in the area. We understand that forest restoration work involves wildlife disturbance. While you did not include this in the DEIS because you could not simply use GIS analysis (page 209), you should not disregard this important aspect when scheduling work.	Activities proposed in the Black Mountain project are designed to minimize disturbance to calving, nesting, and sensitive wildlife species habitat while benefitting those species in the long term. Additionally, Resource Protection Measures (RPM) are implemented to further minimize disturbance by placing disturbance buffers and timing restrictions around known nest sites, sensitive habitats, and within management areas, such as winter range, during critical periods of the year. Please refer to Appendix C for a detailed list of RPMS designed to protect wildlife.
86	12	The ONF should provide the wildlife BE and BA with the DEIS. The DEIS does not provide the Wildlife Biological Evaluation nor the Biological Assessment. To provide the public with an accurate and independent analysis of the Project's effects on wildlife, the BE and BA need to be provided with the DEIS.	The Wildlife Biological Evaluation (BE) is located in the Black Mountain project record and is available upon request. The BE is summarized in the Environmental Impact Statement (EIS) in an effort to reduce the size of the document. Informal consultation with the US Fish and Wildlife Service (USFWS) was not completed prior to release of the Draft Environmental Impact Statement (DEIS), therefore the Wildlife Biological Assessment (BA) was not included. Informal consultation with the USFWS has been completed and the BA will be published online with the Final Environmental Impact Statement (FEIS).
Gray Wolves			
87	3; 7; 9; 12; 20	We are concerned by potential timber sale impacts to Gray wolves. Beyond the project area providing dispersal habitat, the Project will significantly reduce hiding cover for Rocky Mountain elk and displace them to other geographic areas and onto private lands. That will displace dispersing wolves out of the project area and may cause wolves to follow the displaced elk off Forest land and onto private lands, creating problems for both wolves and private landowners. These and other impacts of the Project on wolves should be fully disclosed and discussed in the DEIS.	We acknowledge the commenters concern. Please refer to pages 161-163 of the FEIS for a detailed discussion of effects to the gray wolf.
88	28	The ONF should coordinate with the Service and ODFW during the development of the FEIS to ensure you have the most up-to-date information. Information regarding wolf distribution and dispersals in Oregon and the ONF is dated 2016 (p. 163).	The information regarding wolf distribution and dispersal in Oregon and the Ochoco National Forest has been updated to reflect the most recent Draft Oregon Wolf Conservation and Management Plan (2019). Please refer to pages 161-163 of the FEIS for a detailed discussion of effects to the gray wolf.
89	28	The ONF should contact USFWS or ODFW for assistance regarding information about lethally removing wolves. The document (p.165) indicates "as state and federal agencies have the authority to lethally remove wolves that depredate livestock." Neither the Service nor ODFW have legal authority to lethally remove federally endangered	This statement has been removed in the FEIS.

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		wolves. The Department recommends that that this sentence not be included in the FEIS due to lack of relevance.	
90	20	The ONF should explain how they know there are not wolf dens or rendezvous sites on the Ochoco National Forest without surveys, camera sets, or fur sets for wolves on the Ochoco.	Carnivore surveys have been ongoing on the Ochoco National Forest since 2014 using remote sensor camera trapping and bait stations. To date, no evidence of wolves, wolf dens, or rendezvous sites have been captured on the cameras and bait stations are not utilized. Additionally, ODFW and the USFWS have tracked survey routes during winter months to determine presence or absence of wolves in the area. Any credible sightings are also followed up with camera traps and track surveys to determine presence or absence. To date, no wolves have been found on the Ochoco National Forest.
91	20	The ONF should buffer rendezvous sites all year because they may be used all year (DEIS p.164).	Gray wolves use rendezvous sites, or resting sites, during the summer where pups can grow basic social and physical skills until they are ready to travel with the pack (Stansbury et. al 2014). Although they may use them later into the fall and winter, it is not common as that is a time when the pups can travel with the pack and have developed those skills, thus it is not as critical. Additionally, no known rendezvous sites occur in the Black Mountain project area. Please refer to comment/response 88 for additional information.
92	20	The ONF does not seem to be geared towards protecting Gray wolves from foreseeable negative impacts in the DEIS but only to disclose these potential impacts. NEPA intent for analysis is to guide mitigations or avoidance (protection of harms from management).	The Black Mountain project and Ochoco National Forest will continue to manage the Forest for multiple resources and continue to follow Forest Plan Standards and Guidelines, all applicable and relevant laws and regulations, satisfy the requirements of Forest Service Manual 2672.4, and disclose the effects of proposed actions during the planning process, including NEPA analysis.
Wolverines			
93	28	The wolverine determination section does not definitively state whether the project will impact wolverines. The Department recommends that ONF conduct additional coordination with U.S. Fish and Wildlife Service (Service) and include updated information in the FEIS.	The wolverine is considered a Forest Service Region 6 sensitive species and an effects determination was made following regional direction for sensitive species. However, the wolverine is proposed as threatened by the US Fish and Wildlife Service and therefore requires an effects determination based on whether or not the proposed action would jeopardize the continued existence of the species or result in destruction or adverse modification of proposed critical habitat. The effects determination has been modified in the FEIS on page 165.
Primary Cavity Excavators			
94	25	The ONF should modify the purpose and need. On p. 10 and repeated on p. 11-12, the DEIS states “The increase in the abundance of grand fir and Douglas-fir, increased stand densities, and the development of multiple canopy layers have created an imbalance (compared to historic conditions) in available wildlife habitat, meaning there is an excess of habitat for species that depend on dense, multi-story stands (e.g.	On page 47 of the FEIS, Table 10 – “Existing LOS and Historic Ranges by PAG” shows the Historic Range of Variability (HRV) by Plant Association Group (PAG). Except for the xeric ponderosa pine PAG all others are above HRV in multi-strata Late and Old Structure (LOS). This is a result fire suppression and past timber harvest selectively removing large fire tolerant trees. Active management of dry forests in

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		pileated woodpecker) and a shortage of habitat for species that depend on open, single-story stands (e.g. white-headed woodpecker).” While we concur that there is a need for more white-headed woodpecker habitat, we disagree that there is “an excess” of old growth for pileated woodpeckers.	the project area with commercial thinning and noncommercial thinning would reduce stand densities, restore a more historic species composition, and create a more open, single-story stands, thereby increasing the amount of habitat for species that depend on these vegetation conditions and thus reducing habitat for those that rely on dense multi-strata stands like the pileated woodpecker.
95	22	The ONF should clearly state a conclusion if the Black Mountain project area is currently meeting the standards under the Eastside Screens for snag and green tree replacements.	A conclusion regarding snag and green tree replacement standards has been added to the FEIS (p. 189-190).
96	20	The ONF should fully disclose the findings of Rose et al. (2001) regarding new information about the ecology, dynamics, and management of decayed wood and incorporate it in the DEIS analysis. The “state of the knowledge continues to change” statement is not sufficient justification for not considering this newer best available science in the DEIS analysis regarding the study’s implications for decayed wood management and primary cavity excavators, as the science always continues to change.	Rose et al. (2001) states that biological potential models are a flawed technique, which is what the current Forest Plan Direction, as amended by the Eastside Screens (Amendment #2) directs us to use. However, because the “state of knowledge continues to change” the Black Mountain analysis for Primary Cavity Excavators uses the best available science, which is currently integrated into DecAID version 3.0.
97	20	The ONF should use a project level conclusion and not shift to a Forest level conclusion. DEIS p.201. The conclusion suddenly shifted to the Forest level from the project level to allow for the conclusion of impacts to “little or no” standing dead and/or down wood “across the Forest,” and allow for only a “small” negative trend to be claimed.	The Black Mountain project analysis follows a standardized process for addressing viability of terrestrial and aquatic Management Indicator Species (MIS) when analyzing project proposals under NEPA. The Black Mountain project describes the existing conditions in the project area, relates them to forest-scale conditions, and has calculated the amount of habitat available at the forest-scale and in the analysis area, and relates the two. Please refer to Chapter 3 – Wildlife – Management Indicator Species for additional information.
98	20	The ONF should use the 80% tolerance level in the DecAID analysis. It’s revealing that Figure 9 tables use the 50% tolerance level for woodpeckers species to compare with historic reference conditions when the 80% tolerance level would show a higher level of protection.	Snag densities above the 80% tolerance level are likely created by stand-replacing disturbances. The ONF does not manage for stand replacing disturbances and thus provides for habitat that is more representative of what the wildlife habitat type can support; therefore, the ONF uses the 50% tolerance level.
99	20	The ONF should correct Figure 12. It is hard to interpret as the amount of no down wood >20 inches appears to apply to much more of the watershed.	Figure 12 has been corrected (FEIS 195).
100	20	The ONF should indicate which references were used to estimate dead and down wood in pre-settlement or historic times.	DecAID uses vegetation inventory data from unharvested stands to approximate natural or historical levels. There are several peer reviewed studies specific to eastside forests and habitat that provide estimates of dead and down wood in pre-settlement or historic times, including Youngblood et al 2004; Harrod et al. 1998; Agee 2002; and Korol et al. 2002)
101	11	The ONF should disclose the effects of logging on snag recruitment over time relative to the reference conditions informed by DecAID. The ONF should retain enough untreated areas on the landscape, provide	Please refer to pages 10-12 of the Record of Decision (ROD) for a discussion on the effects of logging on snag recruitment over time relative to the referenced conditions. The FEIS on page 44 and 393

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		generous untreated connectivity corridors, and retain higher basal area in commercial thinning units.	notes that post-harvest residual basal area per acre would be approximately 30 to 60 square feet on drier sites (pine and Douglas-fir) and 50 to 100 square feet on more productive sites (grand fir). Residual basal area per acre could exceed 100 square feet if numerous trees larger than 21 inches dbh or old trees are present. The FEIS goes on to explain that recommended stocking levels vary depending on site quality, tree size and species. Vegetation management activities (commercial thinning, noncommercial thinning, noncommercial hardwood enhancement, and prescribed burning) will only occur on 45 percent of the forested areas in the project area, leaving 55 percent of forested areas in the project area untreated (i.e. all trees retained for future snag recruitment).
Pileated Woodpeckers			
102	20	The ONF should disclose that pileated woodpeckers are now ranked as "vulnerable" in the State of Oregon. This does not seem to be mentioned in the Black Mountain DEIS section on Pileated woodpeckers status and effects.	Pileated woodpeckers are currently managed as Management Indicator Species (MIS) on the Ochoco National Forest. They are not ranked as threatened or endangered by the US Fish and Wildlife Service or by the Oregon Department of Fish and Wildlife (ODFW), nor are they a Forest Service Region 6 sensitive species. A ranking of "vulnerable" by the State of Oregon does not modify the type or level of analysis required for this species.
103	20	The ONF should correct the calculation of loss of pileated habitat (DEIS p.201, 1st line, 2nd to last paragraph). Calculation of loss of pileated habitat to successive recent timber sales on the Malheur NF showed that Wisdom et al. 2000 is no longer correct, as the rate of logging pileated habitat is outstripping any increase in dense multi-layer canopy stands from fire suppression. This is likely also true on the Ochoco.	The Ochoco National Forest is unaware of any science refuting Wisdom et al. 2000 and the commenter did not provide any references. Recent conversations with biologists on the Malheur National Forest concluded that viability for pileated woodpecker is being met while managing for HRV as well. Project design and resource protection measures as well as standards and guidelines are in place to ensure continued viability of pileated woodpeckers on the Ochoco National Forest.
104	20	The ONF should analyze effects to the American marten. Why is there no analysis for effects to American marten for the Black Mountain project timber sale area? We are very concerned by potential effects to marten which would probably be roughly equivalent to effects to pileated woodpecker.	American Marten is not a sensitive species or Management Indicator Species (MIS) on the Ochoco National Forest; therefore, it was not analyzed in the Black Mountain project.
105	20	The Forest Plan consistency suddenly shifts scale to the Forest level for the conclusion regarding pileated woodpecker viability without assessing effects of timber sales to pileated across the entire forest.	The Black Mountain project analysis follows a standardized process for addressing viability of terrestrial and aquatic Management Indicator Species (MIS) when analyzing project proposals under NEPA. The Black Mountain project describes the existing conditions in the project area, relates them to forest-scale conditions, and has calculated the amount of habitat available at the forest-scale and in the analysis area, and relates the two.

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Northern Flicker			
106	20	The ONF should use more updated habitat descriptions for the Northern Flicker. The description for habitat for the Northern Flicker seems outdated, as other EIS analysis for other timber sales notes science citations more recently finding that the Northern Flicker select for larger old growth Ponderosa pine. Other Blue Mountain national forests have the Northern Flicker as a MIS for the large/old growth Ponderosa pine, not specifically for juniper.	The northern flicker was the Management Indicator Species (MIS) selected to represent species that utilize old growth juniper habitat in the Ochoco National Forest Land and Resource Management Plan (Forest Plan). The northern flicker uses a wide variety of plant communities and successional stages as reported by Thomas (1979) including all forest successional stages for foraging, and young (40-79 years) to old-growth (160+ years) for reproduction. However, the northern flicker was selected to represent old growth juniper in the Forest Plan, therefore old growth juniper habitat is the focus of the analysis. Modifying the Forest Plan to have the northern flicker as an MIS for the large/old growth ponderosa pine is beyond the scope of this project.
107	20	The ONF should use more updated habitat descriptions for the Northern Flicker. The DEIS analysis is biased toward an incorrect assumption of little suitable habitat for the Northern Flicker due to Forest Service use of outdated science associated with an outdated Forest Plan. The analysis only considers management actions within juniper habitat and finds that there is no LOS juniper habitat in the project area, yet we saw and heard Northern Flickers throughout most of the Black Mountain sale units. The use of flawed outdated science leads to inaccurate analysis for direct, indirect, and cumulative effects to Northern Flicker of the two action alternatives by focusing only on LOS juniper as suitable habitat and failing to take into consideration much more recent best available science showing that the Northern Flicker select for large Ponderosa pines and would therefore be negatively affected by mature tree logging planned that would greatly reduce the abundance of future large Ponderosa pines. This is inaccurate and inadequate analysis for effects to Northern Flicker, leading to an inaccurate conclusion that is used to support a finding of not contributing to a negative trend in viability on the Ochoco for Norther Flicker.	The northern flicker was the management indicator species selected to represent species that utilize old growth juniper habitat in the Ochoco National Forest Land and Resource Management Plan (Forest Plan). The northern flicker uses a wide variety of plant communities and successional stages as reported by Thomas (1979) including all forest successional stages for foraging, and young (40-79 years) to old-growth (160+ years) for reproduction. However, the northern flicker was selected to represent old growth juniper in the Forest Plan, therefore old growth juniper habitat is the focus of the analysis.
Rocky Mountain Elk and Mule Deer			
108	3; 9; 20	We are concerned by potential timber sale impacts to the following species in particular: Rocky Mountain elk and Mule deer from commercially logging evident elk and deer wildlife corridors within old growth Ponderosa pine stringers (LOS) and along streams in RHCAs, as well as from planned logging in Winter Range habitat, with loss of thermal and hiding cover.	We acknowledge the commenters concern. Please refer to pages 205-214 of the FEIS for a detailed discussion of effects to Rocky Mountain elk and mule deer. Please refer to Appendix C for a detailed list of Resource Protection Measures (RPM) designed to reduce effects to Rocky Mountain elk and mule deer.
109	10	The ONF should analyze effects of road disturbance and security on elk and deer. There is no evidence in the DEIS that such an analysis was performed, and this situation should be corrected for Final EIS.	Please refer to pages 205-214 of the FEIS for a detailed discussion of effects to Rocky Mountain elk and mule deer.

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110	10	The ONF should clarify if the Variable Density Thinning methodology using skips comprising between 5 and 10 percent of each harvest unit (DEIS p54) will provide adequate security and hiding cover for big game and be adequate to avoid displacing them.	Variable density thinning methodology improves heterogeneity within stands, especially in those stands with young trees with low to moderate numbers of older trees. These treatments alone will not provide adequate security and hiding cover for big game as other variables must be considered. For example, the Black Mountain project proposes to close roads, increase cover in hardwood stands, and manage stands for connectivity corridors as well as leaving untreated areas across the landscape to provide for big game habitat.
111	10; 17; 18; 25; 27; 28	The ONF should use an updated model for assessing project impacts to elk. To analyze effects of the proposed alternative actions upon elk the Elk Habitat Effectiveness Index (HEI) Model was utilized as provided for in the Ochoco National Forest land and resource management plan of 1989 (DEIS p173, p222). The HEI was published in 1988, more recent science has shown the HEI has significant frailties as acknowledged (DEIS p222, p225). HEI is no longer best science as required by NEPA and recommend using the Blue Mountain Elk Nutrition and Habitat Model as this is the most current state of the science, and should be used as an evaluation tool for this project.	As of May 2019, the Blue Mountain Elk Nutrition and Habitat Model has not been completed, peer reviewed, and/or approved for use. When the model has been completed, peer reviewed, and/or approved for use, the Ochoco National Forest (ONF) will incorporate it into future analysis. Until that time, the ONF will continue to use the Elk Habitat Effectiveness Index (HEI) as directed by the ONF Land and Resource Management Plan (Forest Plan). It should be noted that the ONF currently incorporates the distance-band approach and the traditional road density method to evaluate habitat effectiveness for elk in relation to roads. Please refer to pages 205-214 of the FEIS for a detailed discussion of effects to Rocky Mountain elk and mule deer.
112	12	The ONF should provide the detailed HEI analysis data that would allow the public opportunity for independent analysis for ONF findings. The HEI calculation tables and worksheets using PIN #11 and the calculation analysis of HEI for distance banding need to be attached as an appendix.	Detailed Habitat Effectiveness Index (HEI) analysis data as well as distance banding values are located in the project record and are available upon request. A brief description of the methodology use for HEI analysis I located on page 158 of the FEIS.
113	10	The ONF should review and revise the effects conclusions as they are in contrast with the decrease in road disturbance and enhancement of forage. RMEF believes that reliance upon HEI analysis of the project impacts upon elk rather than on “best science” has led to the DEIS’s conclusion that, “The overall direct, indirect and cumulative effects would result in a negative trend in habitat (decrease in cover and an increase in disturbance)” (DEIS p228). This is in contrast, with the DEIS touted decrease in road disturbance and enhancement of forage (DEIS p228). A review and revision is recommended prior to the Final EIS.	The effects conclusions for Rocky Mountain elk and mule deer have been edited for clarity (FEIS 214).
114	12	The DEIS uses the “Habitat Effectiveness Index” (HEI) to evaluate how projects affect habitat suitability for elk, a management indicator species. HEI requires an analysis of both cover by conifer type for ponderosa pine and mixed conifer, and road density to calculate the HEI. Besides the lack of disclosure on how these values were obtained, the analysis misrepresents the amount of roads in the area. The analysis only uses ML 2-5 roads (legally open roads) to determine road density. Table 87 on DEIS p. 281 shows 192.6 miles of ML 1-5 roads in the project area (ML1 roads are designated “closed” but don’t usually have any type of barrier to prevent access). If all ML1 roads were actually physically closed, it would be valid to calculate HEI. However,	Forest Service roads are assigned a Maintenance Level (ML) of 1-5 defined by the level of service provided and maintenance required for the road. ML 1 roads are considered “closed” which means they are suitable for nonmotorized uses but closed to motorized traffic and receive minimal custodial maintenance. It is prohibited to possess or operate a motor vehicle on ML 1 roads (36 CFR 261.15) and they are not shown on Motor Vehicle Use Maps (MVUM). ML 2-5 roads are considered “open” which means they are open to motorized traffic and receive varying levels of maintenance depending on the service provided (FSH 7709.59).

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		many of the ML 1 closed roads are only designated closed on the MVUM map and are not physically closed and are driven. If M 1-5 roads are used to calculate the true road density, it is 3.66 miles/mile2 road, exceeding the 1989 LRMP S&G which is 3 miles/mile2 in general forest. Since wildlife HEI calculations in the DEIS only use ML 2-5 roads, it underestimates current road densities and incorrectly shows the project is within LRMP road density standards.	The Ochoco National Forest Land and Resource Management Plan (Forest Plan) includes standards for open road densities specific to management of big game habitat in several Management Areas (MA). MA F22 – General Forage is included in the Black Mountain project area and has an open road density standard of 3 miles per square mile. As directed by the Forest Plan, the Habitat Effectiveness Index (HEI) model is used for estimating elk habitat effectiveness and open road densities. Results of the HEI model completed for the Black Mountain project show the open road density is currently 2.66 miles per square mile and would be reduced to 2.31 miles per square mile with the road closures and decommissioning proposed in Alternatives 2 and 3. The current open road density (2.66) and the projected open road density (2.31) are both below the Forest Plan standard of 3 miles per square mile. Rowland et al. (2005) suggested using a distance band approach to evaluate effects of roads on elk instead of using the HEI open road density that current Forest Plan standards are based on. While the HEI open road density method is required by the Forest Plan, the distance band approach was also used in the Black Mountain project to analyze disturbance to elk from roads. Road closures in the Black Mountain project may include placement of barriers such as trees, rocks, berms, or gates. Physical barriers may also be installed or reinforced on roads that are currently Maintenance Level 1 (closed) roads (i.e. closed prior to Black Mountain), however, it should be noted that physical barriers are not required on ML 1 roads (USFS 2014*b*).
115	12	The ONF is skewing the data to allow harvest by only using averages, where if site specific details were used, it would not allow as much timber harvest, and show the true effects of the proposed project. The DEIS uses the "Habitat Effectiveness Index" (HEI) to evaluate how projects affect habitat suitability for elk, a management indicator species. HEI requires an analysis of both cover by conifer type for ponderosa pine and mixed conifer, and road density to calculate the HEI. Besides the lack of disclosure on how these values were obtained, the misuse of averaging canopy cover and HEI values for ponderosa pine and mixed conifer stands. The LRMP PIN #11 shows that the HEI for ponderosa pine (PP) is 7 and for mixed conifer (MC) 52 in the 3rd decade of the plan (which is current day). Tables 65 and 66 in the DEIS for general forest management area are skewed to only show averages for percent cover and HEI. The LRMP in PIN #11 displays ponderosa pine and mixed conifer separately, indicating the cover values should be at the target of 11 % for PP and 34% for MC for the North Fork Crooked River watershed. By combining and averaging the PP and MC plant association groups the ONF is treating these conifer communities as the same cover value for big game. As shown in LRMP PIN #11 they are	The HEI tables in the Forest Plan are based on data and outputs aggregated at the Forest Level. Because on the ground conditions will vary significantly from this average the Forest wide management objectives were disaggregated down to the District/watershed level in the Plan Implementation Note (PIN 11). PIN #11 describes the steps on how to calculate HEI values and determines the acres of cover needed, the species weighted average needed to derive one average cover quality, compute one average cover quality value from both pine and mixed conifer, and compute one average "percentage of area in cover" value. The HEI value of 7 has been identified in PIN #11 as the average for the PP and MC HEI values for the Howard-Porter Watershed. Therefore, weighted averages were used to take into account for both the PP and MC PAGS.

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		separate conifer communities and have significantly different values to big game. In the Project area, the MC plant association group (PAG) is the primary security habitat for elk. But given the road densities in the project area, most of the MC PAG is not elk security habitat. These tables with the averaging of the canopy cover and HEI incorrectly show that the project is consistent with the LRMP, when it is not.	
116	28	The ONF should take into account parturition (calving) grounds and summer habitat use. Current analysis for elk habitat only includes winter range.	General Forest Winter Range comprises about 55 acres within the project area and therefore was combined with General Forest (33,956 acres). The rationale follows: Plan Implementation Note #11 does not include standards for this portion of General Forest Winter Range and to ensure all big game habitat is accounted for. Please refer to pages 205-214 of the FEIS for a detailed discussion of effects to Rocky Mountain elk within the General Forest Management Area and Appendix C for Resource Protection Measures (RPMs) designed to reduce impacts to calving sites.
117	12; 25	The ONF should use the Region 6 Terrestrial Resource and Conservation Strategy Areas (TRACS), nor the ODFW Oregon Conservation Strategy for protection and restoration of key strategy species and their habitats in the North Fork Crooked River basin and Big Summit areas. The USDA Forest Service PNW Region 6 developed TRACS as a framework for the region and forests to identify key habitats and wildlife species, and to protect, conserve, restore, and enhance habitats for these landscapes. We are concerned that this project has a high potential to disturb important and iconic wildlife species such as Rocky Mountain elk and mule deer that are referenced in TRACS. TRACS identified elk as a priority vertebrate species in the Blue Mountain and East Cascade ecoregions. TRACS recommended that the Blue Mountains Elk Model (the joint ODFW- Forest Service habitat model) be used to identify areas of the highest value for habitat enhancement or restoration. TRACS also recommended that in areas where elk population numbers are below state game management unit objectives (the Ochoco Wildlife Management Unit), projects should be implemented to reduce open road densities where they are excessive and maintain adequate levels of cover (USDA 2012).	The Upper North Fork Crooked River is one of the top 10 in the Region identified for Late-Seral Ponderosa Pine habitat restoration. This project proposes to restore characteristic (i.e. historic) dry forest vegetation conditions in the Black Mountain project area, thereby increasing resilience to insects, disease, fire, and drought; reducing the risk of uncharacteristic high severity fires; enhancing and restoring hardwood communities; and protecting and enhancing wildlife habitat for an array of species. The Black Mountain Project follows the TRACS objectives for elk habitat enhancement needs and is integrated to address multiple resource objectives. For example, vegetation treatments are designed to reduce fuels loads and protect stands from uncharacteristic wildfires, create fuel breaks, enhance meadows, restore aspen, thin juniper and perform prescribed burning, etc. Additionally, the project is proposing to close 17.16 miles of road and decommission an additional 2.97 miles of road. As of May 2019, the Blue Mountain Elk Nutrition and Habitat Model has not been completed, peer reviewed, and/or approved for use. When the model has been completed, peer reviewed, and/or approved for use, the Ochoco National Forest (ONF) will incorporate it into future analysis. Until that time, the ONF will continue to use the Elk Habitat Effectiveness Index (HEI) as directed by the ONF Land and Resource Management Plan (LRMP).
118	12; 25	The DEIS (p. 164-165) reported that “Effects to elk and mule deer from the Black Mountain project would result in a negative trend in habitat. Increased disturbance due to decreases in cover could increase the movements of elk and deer onto areas of the forest that provide greater security or adjacent private lands.” Both elk and deer numbers are well below the ODFW management objectives for the Ochoco Unit	The Black Mountain Project is integrated to address multiple resource objectives. For example, vegetation treatments are designed to reduce fuels loads and protect stands from uncharacteristic wildfires, create fuel breaks, enhance meadows, restore aspen, thin juniper and perform prescribed burning, etc. Additionally, the project is proposing to close 17.16 miles of road and decommission an additional 2.97 miles of road.

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		populations. The Broads are concerned that implementation of this project disregards the intent of the Regional Forester's direction to protect strategy species, habitats and landscapes as well as the forest's obligation to assist ODFW in meeting management objectives for these important wildlife species.	The Black Mountain Project meets the Regional Forester's direction to protect strategy species, habitats, landscapes, and meeting ODFW's management objectives by reducing the likelihood of uncharacteristic wildfires, restoring priority habitats, and reducing open road densities.
119	25	The ONF should not focus entirely upon restoration of forest stands with no balance for restoring elk and mule deer populations. The DEIS (p. 216) states that "Projects occurring across the forest are managing towards HRV and thus reducing cover in habitat types where cover requirements may not be compatible with HRV"…" The overall direct, indirect, and cumulative effects would result in a negative trend of habitat (decrease in cover and HEI, and increase in disturbance)." These landscape projects must be balanced toward all resources not just timber stands.	The conclusion of effects to Rocky Mountain elk and mule deer referenced by the commenter has been edited for clarity (FEIS 214). Restoring Rocky Mountain elk and mule deer populations is not part of the purpose and need of the Black Mountain project. However, the proposed vegetation management activities will increase forage and improve riparian and hardwood habitat, which is important for calving and fawning. Connected actions associated with the project such as road closures will reduce the open road density benefitting elk and other big game. Additionally, the HEI value will remain above Forest Plan goals and objectives and the open road density will remain below Forest Plan standards. Please refer to page 209 for additional information.
120	12	The ONF should not discuss forage as if it is a limiting factor in the project area and is also use it to justify timber harvest in the uplands and riparian areas saying that it will "improve" elk calving habitat. In reality, 41% of the Project area is in grass and shrub-dominated communities, which is forage for elk. Further, much of the current PP and MC PAG also qualify as providing forage which covers approximately 59% of the project area. What is deficient in the Project area is elk security habitat, largely due to the existing road densities of at least 3.6 miles per square mile (ML 1 through 5 roads). See Table 87 in the DEIS. In addition, the commercial and pre-commercial thinning and the prescribed fires will reduce what little elk security habitat is in the Project area, displacing the elk to other Forest areas or onto private land.	Although 41% of the project area may be characterized as either non-forest or as the commenter notes "grass-shrub dominated", the Black Mountain Analysis addresses it as scabland (FEIS 263-264). Scabland plant habitat in the project area has been degraded by exotic annual grasses, especially Japanese brome, cheatgrass, and Ventenata. Additionally, scabland provides early season forage and senesces early in the year. Late season forage is extremely important to elk's nutritional demands, and thus essential to calving success. Late season forage is found in the uplands and riparian areas where enough sunlight can penetrate the forest floor. Thinning, both commercial and non-commercial as well as prescribed burning will increase late season forage. Increasing elk security is not part of the purpose and need of the Black Mountain project. However, the proposed vegetation management activities will increase forage and improve riparian and hardwood habitat, which is important for calving and fawning. Connected actions associated with the project such as road closures will reduce the open road density benefitting elk and other big game. Additionally, the HEI value will remain above Forest Plan goals and objectives and the open road density will remain below Forest Plan standards. Please refer to FEIS page 209 for additional information.
121	12	The ONF should increase elk security habitat. Much of the Project area is heavily roaded, which has significantly diminished the connectivity and quality of elk habitat. Page 77 states: "Currently 92% of the project area can be accessed within 0.5 miles by an open road. After the proposed closure of additional roads, that number would be reduced to 90% of the project area. 97% of the project area would remain accessible to fire suppression resources within 0.5 miles of Maintenance	Increasing elk security is not part of the purpose and need of the Black Mountain project. However, the proposed vegetation management activities will increase forage and improve riparian and hardwood habitat, which is important for calving and fawning. Connected actions associated with the project such as road closures will reduce the open road density benefitting elk and other big game. Additionally, the HEI value will remain above Forest Plan goals and objectives and the open

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		Level 1 roads." Elk security habitat is defined by areas greater than 0.5 miles from a road, in blocks of 250 acres or greater, and greater than 30% of the landscape in elk security habitat. Therefore, the Black Mountain Project area contains essentially zero elk security habitat.	road density will remain below Forest Plan standards. Please refer to FEIS page 209 for additional information.
122	22	Regarding reproductive sites for calving and wallows, the DEIS claims that known sites cannot be identified, and further claims that reproductive sites "move" around. Page 214-215 states: "Identification of specific calving sites is not feasible because they change from year to year because an elk's reproductive strategy is adapted to seasonal fluctuations in forage quantity and quality (Sadlier 1987). Additionally, the timing and location of calving is related to variations in plant phenology, timing of peak forage quality between geographic areas, and the differences in age of the primary sires or cow body condition (Raedeke et. al 2002)." While these references are correct, applicability to the project area is not accurate. The project area is in the heart of elk reproductive range for both calving and breeding. Of critical importance is maintenance of all calving and breeding areas which require cover and distance from roads. The Forest Plan Standard and Guideline is clear about protecting these sites during their respective spring and fall seasons. We recommend the ONF be more proactive about protecting these reproductive sites. The Project area is limited in suitable calving and wallow areas due to the dry nature of the area. Therefore, all riparian areas, aspen stands, spring and seep areas are logical calving and wallow sites and can be easily inventoried and avoided, and they do not change annually. The DEIS does not take a "hard look" at these LRMP standards as required by NEPA. The recent decision from Judge Hernandez on the Ochoco Summit OHV Project reinforces that more data regarding the location of elk calving sites and wallows must be considered.2	Resource Protection Measures (RPMs) 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 in riparian areas (e.g. RHCAs, hardwood stands) that begin during calving season (May 15-June 30) would require surveys prior to implementation to determine if calving elk are present. If calving elk are present, project activities would be postponed until completion of calving season. Project activities implemented in riparian areas (e.g. RHCAs, hardwood stands) that begin before calving season would continue during calving season because disturbance is already occurring and it is unlikely elk would select these locations for calving. RPMs are included in project design to protect wallows during rutting season. Project activities that begin during rutting season (September 1-October 15) would require surveys prior to implementation to determine if any wallows are present. If wallows are located, they would be flagged and no activities would be permitted within 0.25 miles of the wallow during the rutting season. Project activities that begin before the rutting season would not require surveys and would continue through the rutting season because disturbance is already occurring and it is unlikely elk would select these locations for wallows. Please refer to pages 207 and 212-213 of the FEIS for additional information and Appendix C and Appendix E for a complete list of RPMs.
123	20	The ONF should explain what caused the abrupt sharp reduction in the Mule deer population in 2015-2016. Was it a severe winter? Higher summer temperatures? Increased hunting pressure? If mule deer are declining so rapidly this would indicate the need to retain more thermal and/or hiding cover on the Forest. So why is there no discussion in the DEIS about why mule deer are dramatically declining across the West and in the Ochocos? This seems critical for assessing the effects of Black Mountain sale further reductions in forest cover and increased human disturbance and for any comprehensive cumulative effects analysis.	Population estimates for 2016 and 2017 are significantly lower than previous years due to a new sampling method utilized by ODFW starting in 2016. ODFW feels this new technique is more accurate and statistically sound and is the cause for lower numbers and not due to other variables such as those the commenter mentioned.
124	20	The ONF should not be lumping of General Forest Winter Range in with General Forest rather than with Winter Range, as a "Winter Range" designation would mean more protection for elk but possibly less logging to preserve thermal and hiding cover, whereas General Forest would allow for more logging and less elk habitat protection.	The rationale for lumping the two management areas for calculating HEI follows: Plan Implementation Note #11 does not include standards for this portion of General Forest Winter Range and to ensure all big game habitat is accounted for.

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Canada Lynx			
125	3; 7; 9; 20	We are concerned by potential timber sale impacts to the Canada lynx. The Black Mountain DEIS fails to analyze potential impacts to lynx even though it is a Threatened-listed species with positive sightings on the Ochoco.	We acknowledge the commenters concerns. In 2001, the Forest received concurrence from the U.S. Fish and Wildlife Service that implementation of any activities contained within the Forest Plan, as amended, are not likely to adversely affect the Canada lynx outside of an existing Lynx Analysis Unit. At the time this consultation took place there were, and continue to be, no Lynx Analysis Units existing on the Ochoco National Forest. Additionally, the Regional Forester's Special Status Species list (2011 or 2016) does not list this species as present on the Ochoco National Forest. The revised Lynx Conservation Strategy (Lynx Biology Team 2013) did not identify any potential habitat on the Forest. Please refer to pages 160 of the FEIS for additional information.
Goshawks			
126	3; 6; 7; 9; 20	We are concerned about potential timber sale impacts to the Northern goshawk. The ONF should drop the commercial logging in Northern goshawk designated Post-Fledging Areas over 125 acres in alternative 2 and 119 acres in alternative 3. Northern goshawk require greater forest density, as they evolved with dense forest conditions and in open forest areas may be out-competed for prey by other raptors and large owls. The Eastside Screens in the Ochoco Forest Plan were intended not to just designate PFAs, but to protect habitat suitability for goshawks.	The Black Mountain project incorporates standards as identified in the Regional Forester's Forest Plans Amendment #2 (Eastside Screens) as well as the Forest plan to protect raptor nests, habitat around the nests, and minimizing disturbance to nesting individuals. The Eastside Screens and Forest Plan allow harvest to occur within Post Fledging Areas (PFAs) as long as LOS stands are retained and younger stands are enhanced towards LOS conditions. Treatment within goshawk PFAs would retain LOS and increase and maintain tree structure, especially single-strata LOS. Please refer to pages 220-225 of the FEIS.
127	20	The ONF should not use HRV to manage Northern Goshawk habitat. It is not a Forest Service or Forest Plan mandate to manage Northern Goshawk habitat based on HRV.	The Regional Forester's Forest Plan Amendment #2 (Eastside Screens included interim management guidelines for northern goshawk in regards to timber sales. These guidelines include: • Protect every known active and historically used (within 5 years) goshawk nest-site; • 30 acres of the most suitable nesting habitat surrounding all active and historical nest tree(s) will be deferred from harvest; and • A 400 acre Post-Fledging Area (PFA) will be established around every known active nest site. The Ochoco National Forest adheres to these guidelines for all timber sales which is represented in the effects analysis and the Resource Protection Measures (RPMs) located in Appendix C. The Historic Range of Variability (HRV) is used as a measurement tool for assessing viability of Management Indicator Species (MIS). While the goshawk is not an MIS, HRV is used as a tool to demonstrate how much goshawk habitat occurred in the project area historically and how much would occur in the project area after implementation of the project.

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128	20	The ONF should correct Table 71 on DEIS p.224. Why would goshawk in the Long Prairie PFA seemingly be reduced drastically from 401 acres to only 27 acres despite no planned management in that PFA?	Only 43 acres of that Post Fledging Area (PFA) occur within the Black Mountain project area. The remaining 358 acres are located outside of the Black Mountain project area and were not analyzed or displayed in the table in the DEIS. The table has been corrected to reflect the total reproductive habitat within the PFA.
Pronghorn			
129	20	The ONF should provide more analysis on pronghorn. The DEIS has a very unsatisfying analysis for pronghorn. Why is there no population data available from ODFW? Why doesn't ODFW have management objectives for Pronghorn? Does the Forest Service have no management direction for protecting Pronghorn habitat and security?	Big game management on the Ochoco National Forest is a cooperative effort between the Forest Service and the Oregon Department of Fish and Wildlife (ODFW) where the Forest Service manages habitat while ODFW manages populations. The agencies cooperate by managing big game according to pre-established management plans and Management Objectives (MOs) (i.e. population objectives) for each big game management unit as established by ODFW. The Ochoco National Forest Land and Resource Management Plan (Forest Plan) standards and guidelines for pronghorn state "Manage antelope habitat on the Forest in accordance with Oregon Department of Fish and Wildlife population objectives" (Forest Plan 4-248). However, ODFW does not have a management plan or population objectives for pronghorn for reasons that are unknown to the Ochoco National Forest. Until ODFW develops a management plan and population objectives for the pronghorn, analysis in environmental documents is limited and of a qualitative nature that focuses on potential effects to habitat.
Connectivity Corridors			
130	3; 6; 7; 9; 11; 17; 18; 20	The ONF should drop commercial logging, thinning, or burning in designated wildlife corridors. Wildlife connectivity is especially critical for wildlife dispersal to more suitable habitat as extreme climate change eliminates existing habitat suitability in lower areas and habitat further south. Wildlife connectivity corridors are intended to protect the security of dispersing and migrating species, not expose them to predators and hunters by opening these areas through logging. The ONF should also more fully map connectivity corridors as Map 14 in the DEIS does not appear to be accurate. Map 14 shows some LOS stands do not have connectivity corridors, or only have connectivity in one direction rather than two.	The Interim Wildlife Standard of the Regional Forester's Forest Plan Amendment #2 (Eastside Screens) provides direction to maintain connectivity (connectivity corridors) between Late and Old Structure (LOS) stands and between all Forest Plan designated old growth habitats. The Wildlife Standard allows for timber harvest within connectivity corridors so long as criteria (tree size and canopy density) can be met, as well as criteria relating to corridor width. The Wildlife Standard also directs that some amount of understory (if any exists) be left in patches or scattered to assist in supporting stand density and canopy cover. In the Black Mountain project, 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. Although canopy cover would be reduced for Alternatives 2 and 3 as a result thinning activities, unit prescriptions would maintain canopy closure in the top one third of site potential and meet the Interim Wildlife Standard.
Consultation			

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131	12; 17; 18	The ONF needs to formally consult with the U.S. Fish and Wildlife Service for federal listed wolves since this project will significantly reduce big game cover, may disperse big game species onto private lands, and in turn displace wolves that may move through or remain in the project area. While the ONF cites an ESA determination using informal consultation of "May affect, Not Likely to Adversely Affect" per the ESA, the ONF must have a Biological Opinion from the Service so the ONF can incorporate any reasonable and prudent measures required by the BO.	Section 7 of the Endangered Species Act states that *formal* consultation with the US Fish and Wildlife Service (USFWS) is only required when an action is "likely to adversely affect" a listed threatened or endangered species. *Informal* consultation with the USFWS is required when an action "may affect" a listed threatened or endangered species. The Biological Evaluation (BE) prepared for the Black Mountain project found that the project "may affect, but not likely to adversely affect" gray wolf therefore informal consultation with USFWS was initiated in September 2018. Informal consultation was conducted and a Biological Assessment (BA) was prepared and reviewed by the USFWS. A letter concurring with the effects determination in the BA was received from the USFWS on June 19, 2019.
132	10	The ONF should acknowledge consultation with Oregon Department of Fish and Wildlife (ODFW). Consultation is not acknowledged (DEA p28). Due to the big game security, disturbance and potential for displacement to private land acknowledged throughout the DEIS, RMEF strongly recommends consultation and collaboration with ODFW should happen before the Final EA is written.	"Consultation" is an informal/formal process that occurs between the ONF and the United States Fish and Wildlife Service (USFWS) on listed threatened, endangered, or proposed species (see response to comment 128). The ONF coordinates with the Oregon Department of Wildlife (ODFW) on all vegetation management projects and matters pertaining to big game security within and outside the project area.
BOTANY AND INVASIVE PLANTS			
Sensitive Species			
133	3; 4; 6; 9; 13; 20	We are greatly concerned by potential impacts to the many Sensitive-listed plant species on the Ochoco, especially from logging within seasonally wet and riparian habitat, which characterizes suitable habitat for most of the Sensitive plant species listed in the DEIS.	We acknowledge the commenters concern. Please refer to pages 238-274 of the FEIS for a detailed analysis of effects to sensitive plant species, Appendix C for a detailed list of Best Management Practices (BMP) and Resource Protection Measures (RPM) designed to reduce effects to seasonally wet and riparian habitat, and Appendix E for unit specific prescriptions designed to reduce effects to Riparian Habitat Conservation Areas (RHCA).
134	3; 4; 6; 9; 13; 20	The ONF should drop all commercial logging within RHCAs and all Peck's Mariposa lily populations should be buffered, with only noncommercial thinning by hand and prescribed burning allowed to improve habitat outside of the Spring reproductive season. We are very concerned by increased cumulative impacts to endemic Peck's Mariposa lily in particular through planned logging, roading, and other ground disturbance. Peck's Mariposa lily is considered to be threatened throughout its range. Peck's Mariposa lily plant counts in the Black Mountain project area were lower for all but three of 28 populations visited since the prior plant survey.	As discussed in the FEIS, approximately 9% in Alternative 2 and 1% in Alternative 3 of total occupied Peck's mariposa lily habitat in the Black Mountain project area would be included in commercial thinning units. Temporary roads on existing disturbance within Peck's mariposa lily populations would be .14 mile (approximately 0.2 acre total area) in Alternative 2, and .07 mile (approximately 0.1 acre total area) in Alternative 3. The majority of Peck's mariposa lily populations in the project area will not be impacted by commercial thinning, transportation activities, or other ground disturbing actions. Where activities overlap with Peck's mariposa lily populations, Resource Protection Measures (RPM) and site-specific prescriptions in Riparian Habitat Conservation Areas (RHCA) would minimize impacts to plants. Peck's mariposa lily is not associated with dense conifer stands but is often found in partially shaded areas. Vegetation treatments that restore

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			stands to a less dense condition and result in partial shading and open understory would likely benefit Peck's mariposa lily in the long-term. Hand thinning of small diameter trees and prescribed burning alone are not sufficient to achieve the lower overstory tree densities associated with quality Peck's mariposa lily habitat. The species conservation strategy for Peck's mariposa lily (Dewey 2011) recommends a 50-foot avoidance buffer for heavy equipment, based on the premise that heavy equipment could directly damage plants, and that ground disturbance is detrimental to the plant in the short-term. The 50-foot buffer is not based on known habitat requirements for the species. The trade-offs between short-term and long-term impacts to the plant and its habitat resulting from avoidance of vegetation management designed to restore forest stands to a more open condition are not addressed in the conservation strategy. Since only a portion of the Peck's mariposa lily populations within the project area would be included in commercial harvest units, the project provides an opportunity to better understand how forest restoration treatments impact the plant over both the short and long-term. A monitoring program would be implemented that would measure 1) pre-treatment forest stand attributes (such as canopy cover and stand density) and Peck's mariposa lily population levels, 2) monitor implementation of management activities such as commercial thinning, pre-commercial thinning, and prescribed burning, looking at direct impacts to Peck's mariposa lily plants, amount of soil disturbance, adherence to RHCA prescriptions, etc., 3) post-treatment forest stand attributes and Peck's mariposa lily population levels at 1, 3, and 5 year post-treatment intervals. Untreated controls would also be measured. This information would help to better characterize the habitat requirements of Peck's mariposa lily within forested environments, better understand the impact of forest restoration treatments on the plant and would inform the development of conservation recommendations based on known habitat requirements rather than avoidance measures. Please refer to pages 245-247 and 250-259 of the FEIS for a detailed analysis of effect to Peck's Mariposa lily, Appendix C for a detailed list of Resource Protection Measures (RPM) designed to reduce effects to sensitive plant species, and Appendix E for unit specific prescriptions designed to reduce effects to Riparian Habitat Conservation Areas (RHCA).
Special Plant Habitats			
135	25	The ONF should not build or rebuild temporary roads in scablands. One of the special habitats that has been and will continue to be impacted by the transportation system for the Black Mountain project is scablands. Scablands occupy approximately 32% (10,901 acres) of the project area (DEIS p. 103). The open meadow-like areas have very shallow soil and support associated plants that are adapted to this unique habitat. Damage to the soil and vegetation as a result of management activities,	As analyzed in the botany section of the FEIS (p. 266), about 4.57 and 4.46 miles of temporary roads on existing disturbances would be located within scablands in Alternatives 2 and 3, respectively. No new temporary roads would be located within primary scabland vegetation. 7.3 miles of road within scabland vegetation would be closed under both action alternatives. Resource Protection Measures (RPMs) that are intended to minimize impacts to scablands include measures limiting

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		particularly motorized vehicles, is nearly impossible to mitigate. We caution the ONF against building or rebuilding any temporary roads in these unique habitats that are important not only in their own right as special habitats, but for the important qualities they provide for other resources including wildlife use, water quality and water quantity.	new temporary roads located outside of existing disturbances (RPM 58), avoidance of ground disturbing activities (RPM 59), limitations on off-road vehicle use for project activities (RPM 60), and minimization of disturbance in forest-scabland ecotones (RPM 25). These measures are designed to protect scablands from negative impacts and to comply with ONF Land and Resource Management Plan (Forest Plan) standards and guidelines regarding scablands. Please refer to Appendix C for a detailed list of RPMs designed to reduce effects to scablands.
Invasive Plants			
136	25	The ONF should carefully consider that each harvest, thinning or prescribed fire unit, and any portion of temporary road that has the potential to pass through existing weed areas, be carefully reviewed and possibly eliminated from treatment. We especially recommend this for harvest, thinning, burning and temporary roads proposed in RHCAs.	Invasive plant prevention measures and project Resource Protection Measures (RPMs) are in place to minimize the risk of invasive plant introduction and spread. All project activities are subject to relevant measures. For example, sale area maps identify known invasive plant populations and are shown as Areas to Protect (ATP), obligating the timber sale purchaser to avoid the area. Similarly, the District Botanist reviews burn plans prior to implementation to ensure disturbance to invasive plant sites is minimized. For example, invasive plant sites are specifically avoided for direct ignition, parking, and staging areas. Please refer to pages 329-340 in the FEIS for analysis of effects to invasive plants and Appendix C for list of RPMS designed to minimize the risk of invasive plant introduction and spread.
137	20	The ONF should develop a site-specific invasive plant prevention plan for the Black Mountain project. Such a plan would identify vectors for invasive plants such as vehicles and ground disturbance and prioritize avoidance of known dispersal mechanisms such as waterways and new road construction.	An invasive plant risk assessment has been prepared for the Black Mountain project. Please refer to pages 329-340 in the FEIS. The risk assessment discusses potential vectors, identifies known invasive plant populations, and ways to reduce the risk of invasive plant introduction and spread. Invasive plant prevention measures are required under the Ochoco LRMP, as amended by the 2012 Ochoco/Deschutes Invasive Plant FSEIS and incorporated by reference in this FEIS.
TRANSPORTATION			
138	24; 25; 27	The current road density for ML1-5 roads in the project area is approximately 3.66 miles, which exceeds the allowable road density of the LRMP standards and guidelines of 3 miles of road in the project area.	Forest Service roads are assigned a Maintenance Level (ML) of 1-5 defined by the level of service provided and maintenance required for the road. ML 1 roads are considered “closed” which means they are suitable for nonmotorized uses but closed to motorized traffic and receive minimal custodial maintenance. It is prohibited to possess or operate a motor vehicle on ML 1 roads (36 CFR 261.15) and they are not shown on Motor Vehicle Use Maps (MVUM). ML 2-5 roads are considered “open” which means they are open to motorized traffic and receive varying levels of maintenance depending on the service provided (FSH 7709.59). The Ochoco National Forest Land and Resource Management Plan (Forest Plan) includes standards for open road densities specific to

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			management of big game habitat in several Management Areas (MA). MA F22 – General Forage is included in the Black Mountain project area and has an open road density standard of 3 miles per square mile. As directed by the Forest Plan, the Habitat Effectiveness Index (HEI) model is used for estimating elk habitat effectiveness and open road densities. Results of the HEI model completed for the Black Mountain project show the open road density is currently 2.66 miles per square mile and would be reduced to 2.31 miles per square mile with the road closures and decommissioning proposed in Alternatives 2 and 3. The current open road density (2.66) and the projected open road density (2.31) are both below the Forest Plan standard of 3 miles per square mile (FEIS 209).
139	25	The ONF should use the actual road densities (including open, closed and decommissioned roads) to compare them to the LRMP standards for road density requirements. By using only open ML2-5 roads in the analyses for impacts to riparian areas and wildlife habitat and leaving out the alleged “closed roads”, the analyses of impacts from existing roads and trails is subjective and arbitrary, underestimates the impacts, and can lead to further risks to fish and wildlife resources.	The Forest Plan does not include any road density standards specific to watersheds, water quality, riparian habitat or aquatic species. The spatial boundary used for analyzing the existing condition and direct and indirect effects to sediment delivery (i.e. water quality) includes all roads (Maintenance Level 1-5) within the Sediment Delivery Zone (SDZ), which is 300 feet from Riparian Habitat Conservation Area (RHCA) Class I-IV streams (FEIS 104-105). The Forest Plan does include open road density standards specific to management of big game habitat. Please refer to comment/response 134 for additional information.
140	12; 25	The North Fork Crooked River area which includes the Black Mountain project area is considered a Region 6 “priority watershed” which denotes special protections. The Broads are concerned that the amount of additional roads, especially temporary roads, are inconsistent with the USFS Region 6 Terrestrial Resource and Conservation Strategy Areas (TRACS) which was developed as a framework for the region and forests to identify key habitats and species to conserve, restore and enhance habitats for these landscapes (USFS 2012). The TRACS theme is “protect the best and restore the rest”. The TRACS states in the section on Minimum Roads Analysis that “TRACS should be a primary consideration when completing a Minimum Roads Analysis.	The Ochoco National Forest and Crooked River National Grassland Forest-wide Travel Analysis Report (i.e. minimum roads analysis) was completed in 2015. The USFS Region 6 Terrestrial Resource and Conservation Areas (TRACS) was considered during completion of the Travel Analysis Report in 2015.
141	25	The Broads support the closure and decommissioning of roads, but closure needs to be accomplished using physical barriers, and decommissioning needs to be done by obliterating roads. Merely changing their designation on a map or removing them from the MVUM does not accomplish closure and decommissioning. We also recommend that the ONF increase the miles of roads proposed for closure and decommissioning to further accelerate restoration of fish and wildlife habitat.	Please refer to Appendix A for a detailed description of proposed management activities including road closures and decommissioning. Please refer to Appendix D for a detailed list of proposed road closures and decommissioning, which explains some roads are already physically closed on the landscape and would therefore be administratively closed and removed from the Motor Vehicle Use Map (MVUM) as part of the Black Mountain project.
142	19	We support both road closing and decommissioning as positive actions that will provide more areas of reduced wildlife disturbance, more areas for possible non-motorized recreation, and less maintenance expenses on the declining Forest Service budget. For these reasons we would	Thank you for your comment.

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		support additional removal of roads from service and would oppose creation of new permanent roads.	
143	8	The environmental assessment should assess the entire road system within the project area. Once the road system that is needed to implement the proposed action is identified, the roads that are not needed at this time should be ecologically stabilized and considered "closed" rather than formally decommissioning. Road infrastructure is extremely important, and expensive to construct. It may be necessary to utilize these roads again in the future. With the road bed already in place the costs of re-opening are reduced. Seasonal closures or other measures to close roads that are utilized rather than "decommissioning" should be considered if possible.	The Ochoco National Forest and Crooked River National Grassland Forest-wide Travel Analysis Report (i.e. minimum road system) was completed in 2015. Building on the results of the Forest-wide Travel Analysis Report, the Black Mountain interdisciplinary team (IDT) evaluated each road in the project area in depth and recommended road maintenance level changes where needed to meet management and restoration needs, improve forest and stream conditions, increase functional wildlife habitat, eliminate redundant roads, and update the Motor Vehicle Use Map (MVUM) to be consistent with what is on the landscape. Evaluations were completed through GIS analysis of Forest Service Corporate GIS layers and collection of field data from multiple IDT resource specialists. A complete list of proposed maintenance level changes, roads, and rationale for each change is included in Appendix D.
144	26	The ONF should not decommission roads. Instead, "close" the roads that are not to be used and offer use of them to non-motorized recreation such as horse-back riding.	Please see comment/response 143.
145	12	The ONF fails to demonstrate how the Project's roadwork components are consistent with the 2015 Ochoco Travel Analysis Report and the identification of the "minimum road system." The agency must apply the minimization criteria for any road work, including temporary roads, on a route-by-route basis, specifically explaining how the agency has minimized damage to soil, watershed, vegetation, and other forest resources.	Consistency with the 2015 the Ochoco National Forest and Crooked River National Grassland Forest-wide Travel Analysis Report is discussed in both Chapter 1 (p. 16) and Chapter 3 – Transportation (p. 274) of the FEIS. The Travel Analysis Report only incorporates existing Forest Service system roads. Temporary roads are not a consideration in the Travel Analysis Report because they are only built/used on a case-by-case basis for specific projects as needed. Potential effects to soil, aquatics, vegetation, and other forest resources from temporary roads for the Black Mountain project are analyzed in each resource section of Chapter 3 of the FEIS. Appendix C includes a detailed list of Best Management Practices (BMPs) and Resource Protection Measures (RPMs) designed to protect and reduce effects to soil, aquatics, vegetation, and other forest resources.
146	20	The ONF should explain the existing condition of roads (23.66 miles) proposed for reconstruction. Are these closed roads?	Road maintenance and reconstruction may be required to facilitate safe haul of commercial products and safe travel of the general public during the period of commercial use. Road maintenance and reconstruction would occur on Maintenance Level 1-5 roads. Maintenance Level 1 roads are closed roads. Upon completion of commercial thinning operations, the purchaser is responsible for physically closing Maintenance Level 1 roads that they opened for use. Please refer to the Transportation section for additional information regarding road maintenance and reconstruction. Please refer to Appendix A for a detailed description of proposed activities and Appendix C for a complete list of Best Management Practices (BMPs) and Resource Protection Measures (RPMs).

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147	3; 4; 6; 7; 9; 20	We also ask that closed roads that are overgrown, effectively blocked, and/or ecologically damaging not be re-opened and reconstructed	Please see comment/response 146.
RECREATION			
Trails			
148	1; 2	The ONF should ensure that actions taken as part of the Black Mountain project will not compromise routes proposed by the Ochoco Trails Strategy Group. The Ochoco Trails Strategy Group has developed a community trails plan that will be submitted to the Ochoco National Forest by year end 2018. This plan proposes to make the routes used by horse campers at Allen Creek Horse Camp into official system trails. We recognize that this process will take several years, and the trails' official status is by no means assured.	The proposals submitted by the Ochoco Trails Strategy Group (OTSG) in spring of 2019 have not been accepted by the ONF at this time and are therefore not analyzed in the Black Mountain project. The Black Mountain interdisciplinary team (IDT) reviewed the maps and GIS trails data submitted by the OTSG. There are multiple units with different vegetation management treatment that intersect with the proposed trails. However, the proposed trails, which are mostly on Maintenance Level (ML) 1 or 2 roads, would remain usable whether or not they are designated as "official" trails in the future.
149	1; 2	The ONF should leave Road 2200-651 in a manner that it can still be used as a non-motorized trail. Road 2200-651 is slated to be decommissioned. This road is currently used as a trail by Allen Creek visitors and is part of the proposed trail system. We would prefer that the entrances to Road 651 be bermed to prevent vehicle use while still allowing horse use. If it is necessary to rip the road, we request it be left in a manner that it can still be sued as a non-motorized trail alongside Road 22.	The Black Mountain interdisciplinary team (IDT) reviewed the maps and GIS trails data submitted by the Ochoco Trails Strategy Group (OTSG). The data submitted by OTSG does not identify Forest Road 2200651 as part of the proposed trail system, but does identify the nearby Forest Road 2200000 as part of the proposed trail system. Forest Road 2200000 is not proposed for decommissioning. Forest Road 2200651 is currently a Maintenance Level (ML) 2 road and identified as "open" on the Motor Vehicle Use Map (MVUM). However, Forest Road 2200651 is physically "closed" on the ground (natural revegetation, overgrown) and receiving little to no use. This road connects to a larger system of roads proposed for closure and decommissioning to benefit wildlife and will therefore be decommissioned under the Black Mountain project. However, decommissioning the road would not prohibit use by horses or prohibit future development of "official" trails.
Allen Creek Horse Camp			
150	1; 2	The ONF should remove hazard trees at Allen Creek Horse Camp as part of the Black Mountain project.	Removal of hazard trees within Allen Creek Horse Camp will not occur with the Black Mountain project. The ONF evaluates for hazard trees in developed recreation sites on an annual basis using the "Field Guide for Hazard-Tree Identification and Mitigation on Developed Sites in Oregon and Washington Forests". Trees are evaluated and those meeting hazard tree criteria are either monitored, removed, or partially removed.
151	1	The ONF should maintain the cattle guard across Road 2200-600, which leads into Allen Creek Horse Camp. The cattle guard needs to be lifted and its safety wings need to be replaced in order to make it operational and safe. We would like to see this work done while you have the necessary equipment in the area.	Repair and maintenance to the cattle guard across Road 2200600 is outside the scope of the Black Mountain project. This comment has been sent to the ONF recreation, range, and engineering departments for further review.

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152	1; 2	The ONF should repair wire gates around Allen Creek Horse Camp to bring them up to safety standards. Some gates are rickety, and others are very hard to close. Some of the wire gates that provide egress to the camp are not functional for the public, and therefore are left open by anyone passing through. They need to be repaired to cattle proof condition and ease of opening and closing for the public and area campers.	Repair of wire gates around Allen Creek Horse Camp is outside the scope of the Black Mountain project. This comment has been sent to the ONF recreation and range departments for further review.
153	2	The ONF should protect the camp from cattle damage during cattle-grazing periods.	Protection of developed recreation facilities during periods of cattle grazing is outside the scope of the Black Mountain project. There is currently perimeter fencing around the Allen Creek Horse Camp to protect the campground from cattle.
Dispersed Recreation			
154	1	The ONF should protect dispersed sites and the influence areas immediately around them during the project and maintain them in a near-natural state. Dispersed recreation is important to many equestrians.	Dispersed recreation sites typically exhibit a relatively natural appearance even though management activities, such as timber harvest and grazing, may be highly visible nearby (USFS 1989). Vegetation management activities are not restricted in dispersed sites, but the Ochoco National Forest Land and Resource Management Plan (Forest Plan) does require that the naturalness of the immediate area encompassing dispersed sites be protected. Resource protection measures (RPM) would be implemented to protect the naturalness of the immediate area encompassing dispersed sites, including leaving sufficient vegetation to maintain visual screens from roads or other dispersed recreation sites; removal of boundary tags, flagging and markers visible from inside the site; cutting stumps to four inches in height visible from inside the site; and marking leave trees so as to not be visible from inside the site. Landings would not be constructed in dispersed recreations sites unless there is no other feasible alternative. If a landing is required in a dispersed recreation site, the site would be closed to the public during project implementation for public safety. When activities are completed, the site's core area and access to the site would be cleared of debris. Please refer to pages 285-287 of the FEIS for a detailed analysis of potential effects to dispersed recreation sites and Appendix C for a complete list of RPMs designed to reduce effects to dispersed recreation sites.
155	3; 4; 6; 7; 9; 20	The ONF should prohibit commercial logging within and in a visual buffer around dispersed camping sites to maintain recreational values.	Please see comment/response 154.
WILD AND SCENIC RIVERS			
156	3; 9; 13; 20	The ONF should drop planned commercial logging and large wood removal within Segment 2 of the North Fork Crooked River Wild and Scenic River Corridor, as such logging and large wood removal would degrade recreational values of a natural corridor along the river.	Segment 2 of the North Fork Crooked Wild and Scenic River is classified as a "recreation" segment which simply means it is a section of river that is readily accessible by road, may have some development along the shoreline, and may have undergone some impoundment or

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			diversion in the past. The outstandingly remarkable values (ORV) identified for Segment 2 of the North Fork Crooked Wild and Scenic River are scenic values and botanical values (other similar values). The alternatives would not diminish or degrade any of the characteristics which are central to the outstandingly remarkable values (ORV's) that apply to the North Fork Crooked Wild and Scenic River. Commercial thinning, large wood source removal, and fuels reduction proposed in Segment 2 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 for commercial thinning, large wood source removal, and prescribed burning are 350 feet or more from the river and the road and are not visible due to topography, e.g. steep slopes or slope breaks, and vegetative screening. Please refer to pages 296-299 in the FEIS for a detailed analysis of potential effects to the North Fork Crooked Wild and Scenic River.
UNDEVELOPED LANDS			
157	11; 17; 18	The ONF should not treat any areas identified as "undeveloped lands" in Map 20.	No activities are proposed in areas identified as undeveloped lands. Please refer to pages 209-303 in the FEIS for additional information.
158	11	The ONF should include the unroaded areas mapped by Oregon Wild in the analysis.	Analysis of undeveloped lands in the DEIS was performed with different criteria than the unroaded analysis performed by Oregon Wild resulting in different inventories. The methodology used for the Black Mountain project is explained in detail on pages 300-302 of the FEIS.
159	11	The ONF should not limit its analysis of unroaded areas to areas >5,000 acres, because smaller unroaded areas that were not inventoried are ecologically relevant and potentially significant. The NEPA analysis must reflect the growing scientific evidence indicating the significant value of unroaded areas smaller than 5,000 acres and larger than 1,000 acres. Recent scientific literature emphasizes the importance of unroaded areas greater than 1,000 acres.	The DEIS and FEIS include a detailed analysis of undeveloped lands >1,000 acres in size and includes a detailed description of the methodology used to identify undeveloped lands in the project area.
RANGE			
160	12; 19	It is unfortunate that this DEIS does not evaluate livestock grazing management on this area other than to point out the detrimental effects grazing has on soils, vegetation, and many of the wildlife species discussed. We would like to see livestock management discussed as part of the forest restoration goals of this DEIS.	Cattle grazing is not a component of the proposed actions in any alternatives within the Black Mountain EIS as livestock management is outside the scope of this project. Grazing is an ongoing permitted activity and is accounted for within the cumulative effects sections of each resource.
SCENIC QUALITY			

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161	20	The ONF should not include commercial logging within developed recreation sites because it does not meet the Forest Plan requirement that "timber activities will normally not be visually evident."	The ONF Land and Resource Management Plan (Forest Plan) states that "timber activities will normally not be visually evident, but may be used for safety and visual enhancement." However, this statement is referenced in the "Desired Condition" for Management Area (MA) F13 – Developed Recreation and is not a requirement (i.e. a standard) as indicated by the commenter. MA-F13 does have a standard (requirement) that harvest in developed recreation sites occur only for the purpose of maintaining safe and attractive recreational sites (USFS 1989). MA-F13 also has a standard (requirement) that the ONF should use silvicultural treatments to "emphasize maintenance of large ponderosa pine and western larch" and "manage ponderosa pine to encourage large trees and open park-like stands" (USFS 1989). Treatments proposed in developed recreation sites would improve the attractiveness of the sites and surrounding visual influence area and are in line with the previously mentioned standards. After implementation of proposed activities, a forest visitor at the developed recreation sites would observe open park-like stands of large ponderosa with deep fissured bark, a ground cover of soft textured grasses, contrast offered by occasional western larch, western juniper, grand firs, and Douglas-firs. Evidence of commercial thinning, noncommercial thinning, and prescribed burning may be visible after implementation for 1-3 years but would "not normally be visually evident" after this time. In order to maintain scenic integrity levels and naturalness of the area, grapple piles and landings would not be permitted in developed recreation sites and Resource Protection Measures (RPMs) such as removing boundary tags and marking leave trees so as to not be visible from the site would be implemented. Please refer to pages 287-292 of the FEIS for a detailed analysis of effects to developed recreation sites and pages 346-356 for a detailed analysis to the scenic quality of developed recreation sites. Please refer to Appendix C for a detailed list of RPMs designed to reduce effects to developed recreation sites and maintain scenic integrity.
162	20	The ONF should not include commercial logging within visual management corridors. Commercial logging does not meet Forest Plan requirements to "maintain the natural appearing character of the Forest along major travel routes" or keep management activities "usually not evident" or "visually subordinated to the surrounding landscape."	The ONF Land and Resource Management Plan (Forest Plan) states "maintain the 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" (USFS 1989). However, this statement is referenced in the "Emphasis" section for Management Area (MA) F26 – Visual Management Corridors and is not a requirement (i.e. a standard) as indicated by the commenter. MA-F26 does have a scenic quality standard (known as the scenic integrity level) of "moderate" which means landscape character appears slightly altered and noticeable deviations must remain visually subordinate to the landscape character being viewed. Effects to scenic quality are measured by the deviation from the "landscape character"

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			and the "scenic integrity level". However the Scenery Management System (SMS), which is used to analyze effects to scenic quality, states that objectives for scenic quality are: • Based on long-term results and short-term changes are acceptable; • Based on a range of conditions that link to the historic range of variability; and • Based on what is considered "healthy" While there may be short-term (1-3 years) deviations from the scenic integrity levels in Visual Management Corridors (MA-F26) from the Black Mountain project, no long-term deviations would occur. In other words, within 1-3 years management activities will not be evident and will be visually subordinate to the surrounding landscape. Additionally, the treatments proposed in Visual Management Corridors are intended to restore these forested areas to more characteristic (i.e. historic) and healthy conditions which are objectives for scenic quality in the SMS. Please refer to pages 287-292 of the FEIS for a detailed analysis of effects to scenic quality and Visual Management Corridors. Please refer to Appendix C for a detailed list of Resource Protection Measures (RPMs) designed to reduce the effects to scenic quality.
163	20	The ONF should drop commercial logging in visual corridors. With the exception of dense Ponderosa pine plantations, the 923 acres of visual corridor should just be "noncommercial" size thinning and prescribed burning where needed to reduce visual impacts.	Please refer to comment/response 162.
CLIMATE CHANGE, GREENHOUSE GASES, CARBON STORAGE			
164	11; 17; 18; 25	The ONF continues to ignore their contribution to climate change through timber sales. The boilerplate NEPA analysis to discuss carbon and climate is highly disappointing and insufficient and puts individual logging and vegetation treatment projects in the cumulative problem of global GHG emissions. All emissions are part of the problem, and therefore, all land management decisions must be a part of the solution.	The ONF complied with Agency guidance on addressing climate change in project level NEPA. Currently, there are no standardized tools within the Forest Service to estimate all GHG emissions and carbon associated with implementing any of the proposed actions. Given the scope and scale of the proposed project, a qualitative discussion of the effects is provided to provide the decision maker with relevant information. The FEIS at 356-357 describes the project's potential impacts on climate change, including impacts to carbon and greenhouse gasses (GHGs).
165	7; 11; 18; 25	The ONF should correct the climate change analysis for the Black Mountain project. The climate change analysis is limited and inaccurate given recent analyses of potential climate change impacts on the ONF (USDA, Forest Service 2016b). It also makes several misleading statements about climate change and forest carbon, and further, places the role of individual logging projects in the context of global GHG emissions to minimize the role of this project. This section also	The ONF complied with Agency guidance on addressing climate change in project level NEPA. Currently, there are no standardized tools within the Forest Service to estimate all GHG emissions and carbon associated with implementing any of the proposed actions. Given the scope and scale of the proposed project, a qualitative discussion of the effects is provided to provide the decision maker with relevant information.

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		incorrectly infers that logging benefits the climate by increasing forest productivity.	As stated in the FEIS, the project is in line with the suggested practice of reducing forest disturbance effects found in the National Climate Assessment for public and private forests (Joyce et al. 2014). The project proposes to reduce stand densities to increase resistance to drought and insect mortality; use prescribed fire and thinning to increase resistance and resilience to wildfire; and thin overstocked stands to make more growing space and resources available to the remaining trees, resulting in decreased tree stress and development towards larger diameter stands. The release of carbon associated with this project is justified given the overall change in condition increases forest resistance to release of much greater quantities of carbon from wildfire, drought, insects/disease, or a combination of these disturbance types (Millar et al. 2007). This project falls within the types of options presented by the IPCC for minimizing the impacts of climate change on forest carbon, and represents a potential synergy between adaptation measures and mitigation. Actions aimed at enhancing forest resilience to climate change by reducing the potential for large-scale, catastrophic disturbances such as wildfire also prevents release of GHG and enhances carbon stocks (Smith et al. 2014). The proposed action reflects the rationale behind these recommendations because it would improve stand conditions, diversity, density, and structure, allowing the forest to adapt, persist, and function better over time and into the future. The FEIS at 356-357 describes the project's potential impacts on climate change, including impacts to carbon and greenhouse gasses (GHGs).
166	8; 11	The ONF should analyze the type of treatments being proposed and determine through the literature how they will affect carbon sequestration potential through time. There is a large body of literature on management strategies that have the greatest carbon sequestration benefit. In general, actively managing the forest will produce a positive net increase in carbon sequestration thus a positive benefit to reducing anthropogenic effects on climate change (IPCC, 2007).	The ONF complied with Agency guidance on addressing climate change, including carbon sequestration, in project level NEPA. The FEIS states the following: "Timber management projects can influence carbon dioxide sequestration in four main ways: (1) by increasing new forests (afforestation), (2) by avoiding their damage or destruction (avoided deforestation), (3) by manipulating existing forest cover (managed forests), and (4) through transferring carbon from the live biomass to the harvested wood product carbon pool. Land-use changes, specifically deforestation and regrowth, are by far the biggest factors on a global scale in forests' role as sources or sinks of carbon dioxide, respectively (IPCC, Intergovernmental Panel on Climate Change, 200). Projects like the proposed action that create forests or improve forest conditions and capacity to grow trees are positive factors in carbon sequestration." The FEIS at 356-357 describes the project's potential impacts on climate change, including carbon sequestration.
167	8; 11	The ONF should view the direct, indirect, and cumulative effects of carbon sequestration and storage and its relationship to climate change at much larger scales than the general project area because the	Please see comment/response 165 and 166.

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		scientific literature regarding these, only support analysis on larger scales.	
LOGGING SYSTEMS/OPERATIONS			
168	3; 4; 6; 7; 9; 11; 13; 17; 18; 20	The ONF should not construct new "temporary" roads and all older closed roads should not be reopened. If such roads are constructed, it is critical that these roads be decommissioned as described on p. 86. We expect this includes all roads identified on Maps 3, 4 and Maps 7, 8 as either "Temporary Roads (Existing)" or "Temporary Roads (New)".	A “no temporary road construction” alternative in which all commercial thinning would be conducted from existing system roads and no temporary roads would be constructed was considered but eliminated from further study (FEIS p. 23-24). The interdisciplinary team (IDT) analyzed each unit to determine the feasibility of commercial thinning from existing system roads. As a result of this analysis, many units were dropped or reduced in size due to access limitations, reduction in safe and practical operations, and increased environmental impacts. Selection of this alternative would reduce the area that would receive commercial thinning by 2,125 acres which means 41% of the area needing restoration would not be treated. Under this alternative, untreated stands would continue to be vulnerable to mortality from competition with understory trees and the accompanying increase in risk to loss owing to insects, disease and stand replacing wildfire. This alternative would reduce restoration opportunities of some aspen stands and other hardwood communities. This alternative would not demonstrably move the project area towards the future desired condition and would not meet the purpose and need, therefore this alternative was not carried forward in the analysis. After a temporary road has served its purpose, culverts and bridges would be removed, channels cleared, and the approaches would be re-shaped and stabilized. The entire length of the roadbed would be outsloped and scarified to break up the compaction, increase infiltration and provide soil conditions for seeding. The scarified roadbed would be blocked to vehicle traffic at a location where it can be the most effective.
169	20	The ONF should explain the nature of the “existing disturbance” on which 23.4 miles of “temporary roads” would be constructed?	Temporary roads would be installed on existing past disturbance whenever possible. Existing past disturbance is defined as the visual evidence of a road or trail as a result of a past logging operation or user-created roads. New disturbance is defined as the footprint of a temporary road being installed over ground that has no visual evidence of past disturbance.
170	11; 17; 18	The ONF should not build any additional roads in riparian habitation conservation areas. No new roads should be built in the project areas and RHCA units that cannot be reached with existing roads should be dropped and left untreated.	No new permanent roads would be constructed in the Black Mountain project area. Approximately 3.59 miles of temporary roads on existing disturbance and .02 miles of new temporary roads would be built in Riparian Habitat Conservation Areas (RHCA) with Alternative 2. Approximately 3.64 miles of temporary roads on existing disturbance and .36 miles of new temporary roads would be built in RHCAs with Alternative 3. After a temporary road has served its purpose, culverts and bridges would be removed, channels cleared, and the approaches

Comment Number	Commenter	Comment	Response
			would be re-shaped and stabilized. The entire length of the roadbed would be outsloped and scarified to break up the compaction, increase infiltration and provide soil conditions for seeding. The scarified roadbed would be blocked to vehicle traffic at a location where it can be the most effective. Additionally, Best Management Practices (BMPs) and Resource Protection Measures (RPMs) would be implemented to reduce effects in RHCAs. Please refer to Appendix C for a complete list of BMPs and RPMs and Appendix E for unit specific prescriptions designed to protect and reduce effects to RHCAs.
171	8	The ONF should allow as much flexibility as possible within the contract while still meeting the management goals and guidelines contained in the NEPA document. This flexibility allows the purchaser to use the most economically viable systems thus keeping the ability to pay higher stumpage rates. Placing restrictions on the specific machinery to be used severely impacts the economic viability of the timber sale while not improving the end result. Descriptions should be limited to "ground based" or "cable" with a description of the objectives and outcomes desired. Locking in the specific type of logging system in the NEPA document removes flexibility during the implementation stage.	We do not put restriction on specific machinery or logging systems to be used in NEPA document or contracts. We do have some Resource Protection Measures (RPMs) that restrict ground based equipment in certain areas to protect resources.
172	8	The ONF should shift methods for protecting resources from that of firm prescriptive restrictions to one that focuses on descriptive end-results; in other words, describe what you would like the end result to be rather than prescribing how to get there. The primary issues affecting the ability of our members to feasibly deliver logs to their mills are rigid operating restrictions. We understand that the Forest Service must take necessary precautions to protect natural resources; however, we believe that in many cases there are conditions that exist on the ground that are not in step with many of the restrictions described in Forest Service EAs and contracts (i.e. dry conditions during wet season, wet conditions during dry season).	Resource Protection Measures (RPMs) have been developed to allow maximum flexibility for the purchaser while protecting natural resources. Please refer to Appendix C for a complete list of RPMs.
BIOMASS			
173	8	The ONF should designated biomass removal as "subject to agreement" in the contract. There is not enough value in the material removed to "require" biomass removal. Biomass can be removed if it is economically viable to do so, but requiring removal undercuts the viability of the contract and could result in a lack of bids.	All biomass removal in ONF timber sale contracts is "subject to agreement."

CENTRAL OREGON LANDWATCH

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Attachment B

Black Mountain Vegetation Management Project Objection Response Letter

USDA United States Department of Agriculture | Forest Service | Ochoco National Forest | 3160 NE 3rd Street Prineville, OR 97754 541-416-6500

File Code: 1570; 1950
Date: NOV 18 2019

Rory Isbell
Staff Attorney
Central Oregon LandWatch
50 SW Bond Street, Suite 4
Bend, OR 97702

Dear Mr. Isbell:

This letter is in response to your objection (#19-06-07-0004-218(B)) to the draft Record of Decision (ROD) for the Black Mountain Vegetation Management Project, Paulina Ranger District, Ochoco National Forest. I have read your objection and reviewed the project record, the draft ROD, and the final Environmental Impact Statement (FEIS). My review of your objection was conducted in accordance with the regulation at 36 CFR 218 (2013).

PROJECT DESCRIPTION

On July 19, 2019 the legal notice was published announcing the objection filing period on the draft ROD for the Black Mountain Vegetation Management Project in the *Bend Bulletin* and *Central Oregonian* newspaper. In the Draft ROD, the Responsible Official selected Alternative 2, which would authorize management activities on approximately 15,810 acres in the project area including the following activities:

- Commercial thinning in Riparian Habitat Conservation Area (RHCA) - 442 acres;
- Commercial thinning outside RHCA - 4,645 acres;
- Noncommercial thinning only - 1,399 acres;
- Noncommercial thinning after commercial thinning - 5,087 acres;
- Noncommercial hardwood enhancement - 99 acres;
- Reduction of activity generated fuels (prescribed burning) - 6,585 acres;
- Reduction of naturally generated fuels - 8,596 total acres includes:
    - Prescribed burning - 4,133 acres;
    - Conditional burn areas - 4,463 acres (areas not targeted for ignition but where fire may enter from adjacent areas).

Connected and Similar Actions: In order for Alternative 2 to be implemented, the following connected and similar actions are included in the draft decision:

- Material source expansion - 4.7 acres;
- Temporary road construction (new) - 0.5 miles;

- Temporary road construction (existing disturbance) - 23.4 miles;
- Road maintenance - 135.88 miles
- Road reconstruction - 23.66 miles
- Culvert replacement (safety, transportation) - 3 culverts.
- Stream restoration - 7.7 miles;
- Culvert replacement (for fish passage) - 6 culverts;
- Riparian protection fencing - 5.87 miles;
- Riparian pasture creation;
- Large wood source (upland units) - 53 acres;
- Large wood source (riparian units) - 576 acres;
- Roads closed - 17.16 miles;
- Roads decommissioned - 2.97 miles;
- Roads opened - 0.24 miles

OBJECTION ISSUE DISCUSSION AND RESPONSE

Specific to your objection, you raised issues regarding the following: missing data and noncompliance with goals, standards, guidelines and NEPA regulations related to sediment, shade/temperature and large woody debris, and pool quantity and quality; inadequate description and assessment of riparian areas with regard to peak flow and sedimentation, livestock grazing, and the historic range of variability; inadequate description and assessment of elk habitat; arbitrary and capricious road density assessment; arbitrary effects determination for gray wolf; and an inadequate cumulative effects analysis.

The initial objection resolution meeting was held on September 30, 2019, with several follow-up meetings, calls and letters. While no resolution we reached, I believe that the dialogue helped us offer a number of clarifications and changes that partially addressed the concerns that were raised. These include:

- A commitment to continuing dialogue and participating in implementation monitoring with stakeholders throughout the implementation of activities associated with the project;
- Communicating in the final ROD and Implementation Plan how fuel treatment activities will be conducted;
- Communicating in the final ROD that no activities occur in undeveloped areas identified in the FEIS;
- Communicating in the final ROD and Implementation Plan how trees are selected for large wood placement;
- Clarifying in the final ROD how cover will be retained;
- Clarifying in the final ROD how basal area will be retained;
- Clarifying in the final ROD our intent to protect elk calving sites and wallows, modifying resource protection measures for protection of calving sites, and identifying units with potential calving habitat in the Implementation Plan;
- Including information in the final ROD about closed roads with regard to road density;

- Clarifying in the final ROD how snags recruitment over time will be achieved;
- Revising the response to comments to include all objector's comments;
- Modifying or dropping the following units to address issues related to wildlife, elk cover and calving, and INFISH:
    - Unit 3: Drop the 2.5 acres of commercial thinning proposed in General Forest Winter Range (MA-F21). Noncommercial thinning and prescribed burning would be retained on 36 acres in winter range;
    - Unit 51 (10.9 acres): Drop unit from treatment. This is in a Class II RHCA;
    - Units 310.1 (8.3 acres): Drop unit from treatment. This is in a Class I RHCA and pileated woodpecker habitat;
    - 310.2 (14.4 acres): Drop units from treatment. This is in a Class I RHCA and pileated woodpecker habitat;
    - Unit 162 (7 acres): Drop unit from treatment. This is in a Class II RHCA and would have required a stream crossing for access;
    - Unit 189 (22.7 acres): Drop commercial thinning and change to Large Wood Source unit for N. Fork Crooked River. This is in the Wild and Scenic River Corridor;
    - Unit 276 (41.5 acres): Drop unit from treatment. This is in a goshawk post fledging area; and
    - Unit 270 (18.7 acres): Drop unit from treatment. This is partially within a Class II RHCA.

My response to the objection issues raised is enclosed. No other changes or clarifications are merited.

CONCLUSION

Specific to your objection, I conducted my review of the record, final EIS, and draft ROD. Based on my review, I conclude the following:

- The draft decision clearly describes the actions to be taken in sufficient detail that the reader can easily understand what will occur as a result of the draft decision.
- The draft decision considered a range of alternatives that was adequate to respond to the Purpose and Need. The purpose and need and alternatives considered in the FEIS reflect a reasonable range of alternatives, consistent with law, regulation and policy.
- The draft decision is consistent with or moves toward attainment of Forest Plan standards and guidelines.
- The draft decision is consistent with all policy, regulation, law, and direction, and the FEIS contains adequate evidence to support the decision. The record contains site-specific documentation regarding resource conditions, and the Responsible Official's draft decision document is based on the record and reflects a reasonable conclusion.

This concludes my written review of the project. By copy of this letter and the enclosed response document, the Responsible Official may sign the decision after making the changes and

clarifications noted above, then notify interested and affected persons in accordance with the regulation at 36 CFR 218.12 and 36 CFR 220.7(d). This written response is the final administrative review by the Forest Service or the Department of Agriculture [36 CFR 218.10(b)(2)].

Sincerely,

A. SHANE JEFFRIES
Forest Supervisor
Objection Reviewing Officer

Enclosure

cc: Johanna Kovarik, Beth Peer, Elysia Retzlaff, Marcelle Anderson, Heidi Hopkins, Debbie Anderson

Black Mountain Vegetation Management Project
Environmental Impact Statement (EIS)
Paulina Ranger District
Ochoco National Forest
Objection Statements and Responses
November 2019

Objector	Objection Number
Oregon Wild (OW)	#19-06-07-0002-218(B)
Ochoco Forest Restoration Collaborative (OFRC)	#19-06-07-0003-218(B)
Central Oregon LandWatch (COLW)	#19-06-07-0004-218(B)
American Forest Resource Council (AFRC)	#19-06-07-0006-218(B)
Blue Mountain Biodiversity Project (BMBP)	#19-06-07-0007-218(B)

Violations of NEPA/NFMA

Overview and Objector's Suggested Remedies: This objection issue focuses on the concern that the EIS violates NEPA because of the failure to respond to their comments; fails to consider alternatives; and the proposed project is inconsistent with the purpose and need goals. Suggested remedies include reissuing a new EIS with a wider range of alternatives that have considered the publics comments completely.

Objector Statement #1: Objector states that the Forest did not respond to their comments raised on January 28, 2019 and that this is a violation of NEPA. OW at 4.

Response: I find that the Forest considered all comments received from the objector submitted during authorized comment periods and made a determination of specific and timely comments based on criteria found in the Council on Environmental Quality's (CEQ) Code of Federal Regulations (CFR) at 40 CFR 1503.3(a). I also find that that the Forest did address the comments referred to in the objection letter either in the DEIS, FEIS, project record and/or in the FEIS's Response to Comments at 479, in part or fully.

The regulation at 40 CR 1503.4 states that there is a responsibility to respond to comments that fit the requirements of 40 CFR 1503.3(a), while the regulation at 40 CFR 1503.4(a) allows for comments to be addressed individually or collectively. A review of the response to comments in the FEIS found that several of the comments made by the objector were similar to other comments, so responses were grouped. I asked my staff about the omission of the reference to the objector's comment letter; they informed me that the objector's letter was annotated and placed in the record; however, the comments were not specifically included in the comment table due an oversight that can be corrected. The Responsible Official has assured me that the comments made by the objector were reviewed and considered. I instruct the District to revise the Response to Comments table and attach it to the final ROD.

Objector Statement #2: Objector states that the District did not respond to their comments pertaining to roads, specifically about road density, development and use. COLW at 23.

Response: I find that the Responsible Official considered comments made by the objector and assigned them to response(s). I find the language provided in response to collective comments is responsive and adequate.

The regulation at 40 CR 1503.4 requires the agency to respond to comments, while the regulation at 40 CFR 1503.4(a) states that comments may be addressed individually or collectively.

The FEIS described information specific to road density analyses under both wildlife and transportation analyses. See the project record, reports, and Biological Evaluation for additional information. FEIS at 208-209; 211-212; 360; 365; 366; 368; 370; 371; 511-512; 521.

The response to comments at 521-523 addressed comments on the transportation system, including addressing road density, which is correctly calculated using Maintenance Level (ML) 2-5 roads, as noted in the response to comment number #134. FEIS at 521.

Objector Statement #3: Objector states that the District failed to adequately respond to their comments and concerns regarding identification/survey of known elk calving and wallow sites, which is a duty under the Forest Plan and is not in compliance with CEQ regulations regarding incomplete information. COLW at 39-42.

Response: I find that the Forest adequately considered and responded to the objector's comments and concerns.

The regulation at 40 CR 1503.4 requires the agency to respond to comments, while the regulation at 40 CFR 1503.4(a) states that comments may be addressed individually or collectively. The regulation at 40 CFR § 1502.22 addresses Federal responsibility in situations where relevant information is either incomplete or unavailable related to the preparation of environmental impact statements.

The FEIS states "Calving and fawning primarily occurs in proximity to riparian areas that provide access to high quality forage, water, and cover. Aspen stands and other riparian hardwoods such as willow are likely to be attractive areas for calving and fawning. Identification of specific calving sites is not possible because they change from year to year because an elk's reproductive strategy is adapted to seasonal fluctuations in forage quantity and quality (Sadlier 1987). Additionally, the timing and location of calving is related to variations in plant phenology, timing of peak forage quality between geographic areas, and the differences in age of the primary sires or cow body condition (Raedeke et. al 2002). Peer reviewed literature describing calving and fawning habitat that is specific enough for GIS analysis does not exist (Wisdom 2018, personal communications). FEIS at 212.

The FEIS at 212 and 436 discloses standards and guidelines relevant to elk calving sites, which requires the Forest to "Protect the character of elk calving sites (Forest Plan 4-246)" and "Minimize disturbance from human activity during calving season, May 15 to June 30 (Forest Plan 4-246)." The Forest Plan does not require identification of elk caving sites at any specific time prior to implementation.

The FEIS then documents "Activities proposed in the Black Mountain project would protect and enhance the character of riparian areas where calving and fawning are likely to occur. Commercial thinning, noncommercial thinning, noncommercial hardwood enhancement, and prescribed fire would improve forage and browse conditions by reducing canopy cover which provides 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 a more consistent source of forage quantity and quality throughout the early spring and late summer. Riparian restoration would occur along 7.7 miles of streams within the project area. It is anticipated that there would be an increase in the forage available as a result of stream restoration activities, as well as improved conditions for existing hardwoods, with the potential for

expansion within these areas. Due to the treatments, riparian areas within the project area would become more desirable for calving and fawning. Additionally, Resource Protection Measures (RPMs) 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 in riparian areas (e.g. RHCAs, hardwood stands) that begin during calving season (May 15-June 30) would require surveys prior to implementation to determine if calving elk are present. If calving elk are present, project activities would be postponed until completion of calving season. Project activities implemented in riparian areas (e.g. RHCAs, hardwood stands) that begin before calving season would continue during calving season because disturbance is already occurring, and it is unlikely elk would select these locations for calving."

The FEIS states that "wallows may occur throughout the project area, but primarily occur near water, in proximity to riparian areas, or where moist, soft ground can be found (e.g. springs and seeps). Identification of specific wallows is not feasible because like calving areas, they may change from year to year based on seasonal fluctuations in forage or availability of water. Bull elk may return repeatedly to the same wallow, but wallows may also be abandoned after one season which makes maintaining an accurate inventory difficult." FEIS at 213.

The FEIS at 213 discloses standards and guidelines relevant to elk wallows, which requires the Forest to "Protect wallows during rutting season, September 1 to October 15" (Forest Plan 4-246). The Forest Plan does not require identification of elk wallows at any specific time prior to implementation. The FEIS then documents that "Resource Protection Measures (RPMs) are included in project design to protect wallows during rutting season. Project activities that begin during rutting season (September 1-October 15) would require surveys prior to implementation to determine if any wallows are present. If wallows are located, they would be flagged and no activities would be permitted within 0.25 miles of the wallow during the rutting season. Project activities that begin before the rutting season would not require surveys and would continue through the rutting season because disturbance is already occurring, and it is unlikely elk would select these locations for wallows. Please refer to Appendix C complete list of RPMs." See the FEIS at 361 for a description of the RPM.

The FEIS Response to Comments states that increasing elk security is not part of the purpose and need of the Black Mountain project. FEIS at 515. However, the proposed vegetation management activities will increase forage and improve riparian and hardwood habitat, which is important for calving and fawning. Connected actions associated with the project such as road closures will reduce the open road density benefitting elk and other big game. Additionally, the HEI value will remain above Forest Plan goals and objectives and the open road density will remain below Forest Plan standards. FEIS at 209.

In order to partially resolve the objector's concerns, the Responsible Official has agreed to drop several units located in RHCAs to minimize the potential to disturb calving elk. Additionally, RPM #52 will be modified to state "Project activities in riparian areas (e.g. RHCAs, hardwood stands) that begin during calving season (May 15-June30) would require surveys two weeks prior to implementation to determine if calving habitat is present. If habitat is present, project activities would be postponed until completion of the calving season." These changes will be incorporated into the final decision.

Objector Statement #4: Objector states that the District failed to adequately respond to their comments regarding accounting of all roads on the landscape, the effect of roads on Rocky Mountain elk, and the use of total landscape roads in calculating HEI in the project area. COLW at 48-50.

Response: I find that the District adequately responded to the comments and concerns of the objector regarding roads on the landscape, adequately disclosed the effects of roads on elk, and explained, analyzed and provided an adequate explanation of the HEI calculation, incorporating the effect of roads on Rocky Mountain Elk.

The regulation at 40 CR 1503.4 requires the agency to respond to comments, while the regulation at 40 CFR 1503.4(a) states that comments may be addressed individually or collectively.

The Forest Plan at 4-245 states "Big game capability models should be used in project planning to determined habitat effectiveness (HE), as affected by quality and quantity of cover and forage, and open road density" and " Quantity and quality of cover, and open road density are the main factors influencing Habitat Effectiveness Index (HEI) and should be designed in concert to achieve the desired HEI shown." The Forest Plan identifies standards for open road densities specific to HEI in Management Area-F22 General Forage as 3 miles per square mile. Forest Plan at 4-259.

The Wildlife Biological Evaluation (BE) at 53 describes the HEI calculation stating that "The Forest Plan identifies standards for open road density (i.e. the amount of miles of open roads per square mile or section). Open road densities were calculated using information from the Infra Database, a Forest Service database application that manages information on national resources, such as buildings, trails, roads, wilderness areas, and water systems. It is important to note that only open roads (Maintenance Level 2-5) in the Infra Database were used to calculate open road density. Many of the three-digit roads receive very light use until the beginning of archery season, at which time road use increases. Off-highway vehicle (OHV) use within the project area has also increased in the last 10 years, which is primarily associated with the beginning of archery season and related in general to other hunting activities. Many studies have documented that elk avoid areas near open roads (Ager et al. 2003; Lyon 1979; Rowland et al. 2000, 2005). Table 17 displays open road densities by alternative. Rowland et al. (2005) suggested using a distance band approach to evaluate effects of roads on elk instead of using the open road density that current Forest Plan standards are based on. Results from research at Starkey suggested that a road effects model based on distance bands provides a more spatially explicit and biologically meaningful tool than a traditional model based on road density (Rowland et al. 2000, Rowland et al. 2005). Research suggests that elk select areas further away from open roads and the distance band method allows managers to quantify the amount of habitat available to big game at different distances from open roads, whereas the open road density method doesn't quantify the amount of habitat that is away from open roads and therefore providing security habitat for big game. This analysis determines an HEI value calculated using the distance band approach method and the open road density method to describe the effects of disturbance to elk from open roads across the landscape (Table 18)."

The FEIS at 208-214 documents how HEI was considered along with relevant effects, while the FEIS at 360, 365-366, 368 and 370-371 describes project consistency with the standards that apply to big game and HEI in particular. Finally, the response to comments at 511-512 and 521 address HEI.

Objector Statement #5: The objector states the "FEIS failed to consider alternatives that would provide a more optimal mix of treated and untreated areas and consider strategic choices to avoid adverse impacts from road construction." OW at 6. Another objector is concerned that there was an inadequate range of alternatives proposed and that they suggested three and only one was considered. BMBP at 5.

Response: I find that the Responsible Official developed and analyzed an adequate range of alternatives and considered strategic choices to avoid adverse impacts from road construction.

The regulation at 40 CFR 1502.14(a) requires an EIS to "Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated."

The FEIS at 21-24 document consideration of the No Action Alternative and two action alternatives and evaluated three additional alternatives that were dismissed as not meeting the purpose and need for the project. Adequate consideration was given to scoping comments and the agency responded to comments about the range of alternatives in the FEIS at 482-483. The draft ROD at 1-6 and 9-11 also documented the alternatives considered and how each alternative did or did not meet the purpose and need. Alternative 2 was determined to best meet the scope and scale and purpose and need for the project. FEIS at 1-5.

The FEIS documents no new permanent roads would be constructed and approximately 0.5 miles of new temporary roads (new) and 23.4 miles of temporary roads on existing disturbance would be constructed. FEIS at 22. The FEIS states "Temporary roads are normally constructed with the same equipment used for logging such as feller bunchers, rubber-tired skidders and dozers. Construction is normally executed as lightly as possible to minimize disturbance, impacts to adjacent resources and to reduce the required rehabilitation once the road has served its purpose. These roads will frequently be constructed to have outsloped road beds, associated drain-dips and water spreading ditches to protect the integrity of the road and surrounding terrain. Culverts or some type of bridge shall be required at all points where it is necessary to cross streams. These devices shall be of sufficient size and design and installed in a manner to provide unobstructed stream flow and to minimize impacts to streams. After a temporary road has served its purpose, culverts and bridges would be removed, channels cleared, and the approaches would be re-shaped and stabilized. The entire length of the roadbed would be outsloped and scarified to break up the compaction, increase infiltration and provide soil conditions for seeding. The scarified roadbed would be blocked to vehicle traffic at a location where it can be the most effective." FEIS at 400. The FEIS documents Best Management Practices and Resource Protection Measures designed to protect soil and water resource values during land management activities, including temporary road construction. FEIS at 429-434. During the objection resolution process, the Responsible Official clarified with the objectors that vegetation management activities, including thinning and burning, would only occur on 45% of the forested areas in the project area, leaving 55% of forested areas in the project area untreated. This information will be included in the final ROD.

Objector Statement #6: The objector is concerned that economic viability and support for the local infrastructure were not part of the purpose and need of the project as they suggested in their comments. AFRC at 2.

Response: I find that that the Responsible Official adequately determined the purpose and needs of the project, which was based on the gap between existing and desired vegetative conditions.

The regulation at 40 CFR 1502.13 requires that an EIS briefly specify the purpose and need to which the agency is responding. The Responsible Official has the responsibility for determining adequacy of the purpose and need for projects based on assessment of the problem within the area of analysis. The purpose and need was developed by comparing the existing condition of forest stands within the area of analysis with the desired conditions for improved forest health. The Responsible Official then determined the purpose and need, as developed by the project's ID team, was predominately forest health.

The FEIS at 8-12 documented the purpose and needs of the project, which focuses forest management activities that would move the existing conditions towards desired conditions, primarily by focusing on areas where there is risk of increased insect and disease activity, areas where low intensity fire could be

restored, enhancing hardwood communities that have been encroached upon by conifers, and restoring dry forest habitats for wildlife species. The purpose and need is also addressed in the FEIS Response to Comments at 481. The economic analysis was used as part of the rationale for selecting Alternative 2. FEIS at 340.

Objector Statement #7: Objector states that the District did not 1) incorporate their scoping comments on cumulative effects, and 2) failed to include an inclusive list (including details) of past, present and reasonably foreseeable future actions (specifically excluding Canyon, Wolf, Zane and Spears vegetation management projects); 3) use broad, forest-wide spatial boundaries/scope for analysis (by limiting analysis to the project boundary or activity area for insect/disease, dwarf mistletoe, connectivity corridors, riparian habitat conservation areas, and coarse woody debris); 4) failed to provide adequate support for the narrow analysis area; and 5) failed to identify and incorporate specific wildlife habitat and unique attribute requirements. COLW at 57-64.

Response: I find that the Responsible Official documented how scoping comments were considered; which projects have the potential to contribute to cumulative effects; documented the scope and scale of the analysis area; and adequately addressed wildlife habitat.

The regulation at 40CFR 1501.7 defines and describes scoping; the regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action; and the regulation at 40 CFR 158.25 defines how the scope of the project is determined.

The District sent out scoping information on the project in 2015 and in 2017. Objector submitted scoping comments on May 17, 2017. According to the FEIS, one key issue was identified around potential violations of INFISH, while seventeen analysis issues were addressed, including areas of analysis identified by the objector. In addition, the project record includes a document titled "Scoping 2015 Comment Analysis" and "Scoping 2017 Comment Analysis" that indicate scoping comments were considered.

The FEIS at 34-36 includes a list of projects whose effects have the potential to overlap in time and space with the effects of the Black Mountain Project that could potentially contribute to cumulative effects. In 2005, the Council on Environmental Quality (CEQ) provided guidance to federal agencies that specifically states that "Agencies are not required to list or analyze the effects of individual past actions unless such information is necessary to describe the cumulative effect of all past actions combined" and "Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." Several of the projects mentioned by the objector have been completed and as such, need not be "catalogued."

Each resource specialist defined the scope and scale of their analysis area, in compliance with CEQ guidance in Chapter 3 of the FEIS. While some impacts occur on smaller, more narrowed scales, other impacts are discussed at the Forest scale, for example, in the discussion of Management Indicator Species, where viability is determined at the Forest scale.

Wildlife attributes, including connectivity corridors, were analyzed in detail in the FEIS at 225-228, as well as in the Biological Evaluation (BE) at 70-73.

Objector Statement #8: Objector states that the EIS violates NEPA because the project is not consistent with all the purpose and need goals. BMBP at 3. Objector further elaborates that the need should be based on current habitat conditions, which they field surveyed and documented in their survey sheets. BMBP at 3-4.

Response: I find that FEIS included a description of the need for action.

The regulation at 40 CFR 1502.13 requires that an EIS briefly specify the purpose and need to which the agency is responding.

The FEIS at 7-12 documents the historic and current conditions of the project area and the primary needs for action. The FEIS at 42-46 documents the resource indicators and measures used to determine how each alternative met the purpose and need for vegetation, while the FEIS at 64-77 documented the resource indicators and measures for fire and fuels, again showing how the alternatives met the need for action.

Objector Statement #9: Objector states that the Forest does not offer compelling evidence that fuel reduction treatments in the west have significantly reduced the risk of wildfire. BMBP at 3.

Response: I find that the Responsible Official adequately considered and disclosed relevant and best available science regarding the effects of fuel reduction treatments.

The regulation at 40 CFR 1502.13 requires that an EIS briefly specify the purpose and need to which the agency is responding. The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

The FEIS at 7-12 documents that the purpose and need for the project does not assert that fuel reduction treatments would reduce the risk of wildfire. The purpose and need asserts that restoring species composition, reducing densities, and reducing surface/ladder fuels to more historic conditions would support low and mixed severity fires rather than high severity fires.

The FEIS at 64-79 analyzes the effects of the alternatives through modelling and cited literature to demonstrate how the proposed fuel treatments would affect ground, ladder and crown fuels in order to support low and mixed severity fires rather than high severity fires. In particular, the FEIS at 74 states that "Studies have shown that these types of treatments to decrease fire behavior have been successful in reducing wildfire severity, particularly when prescribed fire is incorporated no longer than 10 years previously (Omi 2015)."

The FEIS at 496, in response to comments, addressed this concern initially raised by the objector who asked that the District disclose that there is no significant evidence that fuel reduction logging reduces the incidence, severity, or extent of wild fires. The response states that "In the FEIS, the Fire Behavior analysis in Chapter 3 – Fire and Fuels discusses the effects of thinning as well as referencing a synthesis of the Theory and Practice of Wildland Fuels Management (Omi 2015) which in turn references numerous studies on the effectiveness of fuels treatments in reducing wildfire severity especially when mechanical treatments and prescribed fire are used in combination. The fire and fuels report discusses the frequency of natural ignitions in the project area and discrepancy between historical fire regime and recent fire occurrence as well as disclosing the fine fuel increase, increased wind speeds, and facilitated spread of surface fire. Additionally, fire behavior modeling incorporates sever[e] weather conditions. Please refer to the Fire and Fuels section in the FEIS."

Objector Statement #10: Objector states that the Forest does not comply with NFMA because it doesn't ensure the viability of Management Indicator Species (pileated woodpecker, American marten, primary cavity excavator woodpeckers, redband trout, and Rocky Mountain elk, northern goshawk) and other

species (Threatened-listed gray wolf; Threatened-listed Canada lynx; Sensitive-listed Wolverine; Sensitive-listed Pacific fisher; Sensitive Columbia spotted frog, and Sensitive-listed redband trout). BMBP at 9.

Response: I find that the Responsible Official complied with NFMA and ensured that species viability would be maintained after implementation of the project.

National Forest Management Act of 1976 (NFMA) requires that Forest Plans be prepared that "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives." The 1982 Planning Rule required that "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to ensure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area."

Management Indicator Species, including primary cavity excavators, pileated woodpecker, and Rocky Mountain elk are addressed in the FEIS at 186-214, while Goshawk are addressed in the FEIS at 220-225. Wolves are addressed in the FEIS at 161-164, while wolverine are addressed in the FEIS at 164-165. Columbia spotted frog and redband trout are addressed in the FEIS at 122-156. Viability for all species found in the project area will be maintained.

American marten is not a sensitive or management indicator species on the Forest and the Pacific fisher is not a sensitive species for the Forest; as such, these species were not analyzed for this project. The FEIS states "In 2001, the Forest received concurrence from the U.S. Fish and Wildlife Service that implementation of any activities contained within the Forest Plan, as amended, are not likely to adversely affect the Canada lynx outside of an existing Lynx Analysis Unit. At the time this consultation took place there were, and continue to be, no Lynx Analysis Units existing on the Ochoco National Forest." FEIS at 160 and 516.

Objector Statement #11: Objector states that the Forest does not comply with NFMA because it doesn't follow guidelines for Wild and Scenic River Corridors and developed recreation and visual corridors. BMBP at 9 and 15. Objector states that logging within Developed Recreation sites does not meet the Forest Plan management area requirement and that the purpose and need for commercial logging in the Black Mountain sale does not include safety and visual enhancement specific to the developed recreation areas. BMBP at 15. Objector also states that logging within Visual Management Corridors does not meet the Forest Plan Management Area requirement. BMBP at 16.

Response: I find that the project complies with NFMA and that direction in the Forest Plan was followed.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

Segment 2 of the North Fork Crooked Wild and Scenic River occurs in the project area and has two identified outstandingly remarkable values (ORV): scenic values and botanical values. The FEIS at 298 states "Scenic values were determined to meet the criteria as an ORV because of the old growth ponderosa pine, larch, aspen, and willow, a ribbon of riparian vegetation along the river, open grassy meadows seasonally filled with wildflowers, and the rippling river. Botanical resources were determined to meet the criteria as

an ORV because of the old growth ponderosa pine forests and sensitive plant species (e.g. Peck's mariposa lily) located near the river."

Noncommercial hardwood enhancement is proposed in Unit 180 (0.6 acres) to enhance and restore aspen directly adjacent to the river. 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. This treatment would have no effect on the botanical values because it would not occur in old growth ponderosa pine and there are no known populations of sensitive species in this unit. FEIS at 298. Commercial thinning, large wood source removal, and fuels reduction proposed in Segment 2 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 for commercial thinning, large wood source removal, and prescribed burning are 350 feet or more from the river and the road and are not visible due to topography, e.g. steep slopes or slope breaks, and vegetative screening. FEIS at 298. Commercial thinning, large wood source removal, and prescribed burning proposed in Segment 2 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 occur in old growth ponderosa or in locations where sensitive plants species occur. FEIS at 298. There are no other anticipated impacts to the Wild and Scenic River, because there are no other proposed activities that would affect the outstandingly remarkable values identified for the North Fork Crooked Wild and Scenic River.

As for developed recreation sites, the response to comments specifically noted that "The ONF Land and Resource Management Plan (Forest Plan) states that "timber activities will normally not be visually evident but may be used for safety and visual enhancement." However, this statement is referenced in the "Desired Condition" for Management Area (MA) F13 – Developed Recreation and is not a requirement (i.e. a standard) as indicated by the commenter." FEIS at 526. The response continues, stating that "MA-F13 does have a standard (requirement) that harvest in developed recreation sites occur only for the purpose of maintaining safe and attractive recreational sites (USFS 1989). MA-F13 also has a standard (requirement) that the ONF should use silvicultural treatments to "emphasize maintenance of large ponderosa pine and western larch" and "manage ponderosa pine to encourage large trees and open park-like stands" (USFS 1989). Treatments proposed in developed recreation sites would improve the attractiveness of the sites and surrounding visual influence area and are in line with the previously mentioned standards. After implementation of proposed activities, a forest visitor at the developed recreation sites would observe open park-like stands of large ponderosa with deep fissured bark, a ground cover of soft textured grasses, contrast offered by occasional western larch, western juniper, grand firs, and Douglas-firs. Evidence of commercial thinning, noncommercial thinning, and prescribed burning may be visible after implementation for 1-3 years but would "not normally be visually evident" after this time. In order to maintain scenic integrity levels and naturalness of the area, grapple piles and landings would not be permitted in developed recreation sites and Resource Protection Measures (RPMs) such as removing boundary tags and marking leave trees so as to not be visible from the site would be implemented. Please refer to pages 287-292 of the FEIS for a detailed analysis of effects to developed recreation sites and pages 346-356 for a detailed analysis to the scenic quality of developed recreation sites. Please refer to Appendix C for a detailed list of RPMs designed to reduce effects to developed recreation sites and maintain scenic integrity." FEIS at 52.

Final Remedies/Resolution for Violations of NEPA/NFMA: As documented in the response to Objector Statement #1I instruct the District to revise the Response to Comments table and attach it to the final ROD.

The Responsible Official has assured me that the comments made by the objector were reviewed and considered. As documented in the response to Objector Statement #3, in order to partially resolve the objector's concerns, the Responsible Official has agreed to drop several units located in RHCAs to minimize the potential to disturb calving elk. Additionally, RPM #52 will be modified to state "Project activities in riparian areas (e.g. RHCAs, hardwood stands) that begin during calving season (May 15-June30) would require surveys two weeks prior to implementation to determine if calving habitat is present. If habitat is present, project activities would be postponed until completion of the calving season." These changes will be incorporated into the final decision.

Forest Plan Requirements

Overview and Objector's Suggested Remedies: These objection issues focus on the concern that the Forest did not meet some of their requirements within their Forest Plan.

Objector Statement #12: The objector states the Forest is "in potential violation of Forest Plan standards and guidelines for riparian area (RHCA) protection; scenic values, snag density, and protection of soils through proposed actions." BMBP at 9 and 17-18.

Response: I find that the District documented how the project complies with the Forest Plan.

The NFMA of 1976 requires that "Resource plans and permits, contracts, and other instruments for the use and occupancy of National Forest System lands shall be consistent with the land management plans."

The FEIS documents potential impacts to Riparian Habitat Conservation Areas in the FEIS at 54-57; 145-156; 377-379; 429; 433-435; 449-461; and 504-506. Potential impacts to scenic values are documented throughout the FEIS at 346-356; 366; 368; 371; 372; 373; and 526-527. Snag densities and any potential impacts are disclosed in the FEIS at 186-198; 360; 376; and 508-509. Potential impacts to soils are disclosed in the FEIS at 82-91; 362; 380; 429-433; and 496. For additional disclosure on snag densities and forest plan standards please see the response to Objector Statement #33.

The FEIS at Chapter 4 details consistency with the Forest Plan (FEIS at 359-380). FEIS Appendix C (FEIS at 429-442) is a complete list of Best Management Practices (BMPs) and Resource Protection Measures (RPMs) designed to protect natural resources and reduce impacts. It includes Scenic Quality (FEIS at 441-442), snags for wildlife (FEIS at 435-436) and soils (FEIS at 430-433). FEIS Appendix E (FEIS at 449-461) details unit specific prescriptions designed to protect and reduce effects to RHCAs.

Objector Statement #13: The objector states the EIS violates the Forest Plan by further setting back attainment of INFISH/PACFISH objectives. BMBP at 12.

Response: I find that the District complied with the Forest Plan related to INFISH objectives.

The FEIS documents that "The Inland Native Fish Strategy (INFISH) was intended to be interim direction to protect habitat and populations of resident native fish and to provide options for management. The INFISH delineated Riparian Habitat Conservation Areas (RHCAs) where riparian-dependent resources receive primary emphasis. These RHCAs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems. These areas will be managed to maintain or restore water quality, stream channel integrity, channel processes, sediment regimes, instream flows, diversity and productivity of plant communities in riparian zones, and riparian and aquatic habitats to foster unique genetic fish stocks that evolved within the specific region." FEIS at 377.

Silvicultural practices may be applied in RHCAs to acquire desired vegetation characteristics where needed to attain RMOs and in a manner that does not retard attainment of RMOs and avoids adverse effects on inland native fish (INFISH at E-7). The Black Mountain project interdisciplinary team carefully evaluated each RHCA and site-specific prescriptions were developed for each RHCA based on slope, aspect, stream condition, soil conditions, existing vegetation, large woody material, and potential shade zone (PDZ). These include no treatment buffers of various widths adjacent to stream channels, equipment restrictions, felling trees in/towards streams for large woody debris, diameter limits, and modifications to silvicultural prescriptions. FEIS at 55, 377, and 449. Site-specific prescriptions (FEIS at 449-461) were designed to accelerate the development of large trees for future down wood recruitment; retain and increase the abundance of existing old and/or large trees; reduce risk of high severity wildfire and loss of large trees to insects and disease; and increase the abundance and vigor of hardwoods for future down wood recruitment. FEIS at 55, 377, and 449. Prescriptions also include the felling and leaving of trees to provide large wood in the RHCAs. FEIS at 377 and 449-461.

Riparian Habitat Conservation Areas and INFISH are addressed in the FEIS at 54-57 (RHCA conditions and effects in Forested Vegetation); 145-150, 153 (RHCA vegetation ecology conditions and effects, including cumulative, in Aquatic Biota); 377-379 (consistency with Forest Plan and INFISH); 429-435 (Aquatics Best Management Practices and Resource Protection Measures); 449-461 (RHCA Prescriptions); 504-506 (RHCA-specific responses to DEIS comments). Stream channel habitat features are described in the Hydrology and Aquatic Biota sections (FEIS at 93-157). Appendix C (FEIS at 429-442) is a complete list of Best Management Practices (BMP) and Resource Protection Measures (RPM) designed to protect and reduce effects to RHCAs, and Appendix E (FEIS at 449-461) details unit specific prescriptions designed to protect and reduce effects to RHCAs.

During the objection resolution process, the Responsible Official committed to continued dialogue with stakeholders, as well as engaging stakeholders during implementation monitoring. In addition, discussion of RHCA prescriptions could be a topic of future field trips. As documented in the response to Objector Statement #3, several RHCA units will be dropped from the final decision, further minimizing potential impacts to RHCAs.

Final Remedies/Resolution for Forest Plan requirements: The FEIS documented how the project complied with the Forest Plan. As documented in the response to Objector Statement #3, as part of the objection resolution process, several RHCA units will be dropped from the final decision, further minimizing potential impacts to RHCAs. No remedies or resolutions are needed.

Unroaded Areas

Overview and Objector's Suggested Remedies: This objection issue focuses on the concern that the EIS fails to analyze roadless areas that are less than 5000 acres.

Objector Statement #14: The objector states the "the agency cannot limit its analysis of roadless areas to inventoried areas >5,000 acres, because smaller roadless areas that were not inventoried are ecologically relevant and potentially significant. The NEPA analysis must reflect the growing scientific evidence (cited in our prior comments) indicating the significant value of roadless areas smaller than 5,000 acres and larger than 1,000 acres." OW at 5.

Response: I find that the FEIS addressed undeveloped lands.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

The FEIS at 299-303 outlined the methodology used to assess potential impacts to undeveloped lands at least 1,000 acres in size. As documented in the FEIS, "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." FEIS at 300.

The FEIS at 302-303 documents that there are two polygons greater than 1,000 acres within the project area and further documents that there are no proposed activities that would occur within these two polygons; as such, there are no direct, indirect or cumulative effects that are expected to occur. The FEIS refers to Map 20 for a visual representation of these areas.

Objector Statement #15: The objector asks that the Forest clearly identify the location and size of any undeveloped lands identified by the Forest Service so that we can evaluate which areas are artifacts of the GIS system not recording early past logging, and which have likely never been roaded or logged and to drop any logging in undeveloped lands. BMBP at 19.

Response: Please see the response to Objector Statement #14.

Final Remedies/Resolution for Unroaded Areas: Undeveloped lands were considered in the FEIS and there are no project activities that would occur in the two polygons identified in the project area. No remedies or resolutions are needed.

Roads

Overview and Objector's Suggested Remedies: This objection focuses on the concern that roads will be decommissioned and may need rebuilt in the future at a greater expense. Objector believes that the resource benefit does not outweigh the benefit of future access. Suggested remedy by Objector AFRC is to eliminate any permanent road decommissioning. Suggested remedies by Objector COLW are to revise or prepare a supplemental DEIS that includes the remedies they suggest in their objection at 50-51.

Objector Statement #16: Objector objects to the decommissioning of roads and would like the forest to provide clear rationale for why certain roads are decommissioned over other roads. AFRC at 3.

Response: I find that the Responsible Official provided clear rationale for changing the road maintenance levels, including why certain roads would or would not be decommissioned.

The District used the analysis for the 2015 forest-wide travel analysis as a starting point to complete a project-level travel analysis for the Black Mountain project area. FEIS at 16. The project interdisciplinary team evaluated each road and recommended road maintenance level changes where needed to meet management and restoration needs, improve forest and stream conditions, increase functional wildlife habitat, eliminate redundant roads, and update the Motor Vehicle Use Map to be consistent with what is on the landscape. FEIS at 274, 278. A complete list of proposed maintenance level changes, roads, and rationale for each change is included in Appendix D. FEIS at 443-448.

Objector Statement #17: Objector states that the Responsible Official cannot make an informed decision regarding road-related impacts because the road and trail densities are not visually depicted on a map, nor are they analyzed as contributing to direct, indirect or cumulative effects. COLW at 23-26.

Response: I find that the Responsible Official made an informed decision regarding road-related impacts and that the FEIS documented potential impacts from roads.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

Roads are visually depicted in the map packet that was published with the FEIS. It is unclear how the objector would like to see "road and trail densities" depicted, other than what was completed for the FEIS.

Roads are discussed throughout the FEIS and in detail in the Transportation section. FEIS at 274-282. Maps 11 and 12 depict the transportation activities proposed with this project, while Maps 3 and 4 depict temporary roads. Existing road and trail densities are considered in the affected environment of the FEIS; there are no proposed changes to the trail system; as such, it was not analyzed. Road closures and decommissioning were analyzed in the effects sections, because these actions would change road densities. FEIS at 274-282. Individual resource areas addressed impacts from roads, where applicable. FEIS at Chapter 3.

Objector Statement #18a: Objector believes that the District has "mislead the decisionmaker" by concluding that road densities in the project area meet the forest standard of less than 3 miles/square mile, which they state is false and arbitrary, and is confounded by the conclusion that roads do not cause impacts to streams, riparian areas, aquatic and wildlife biota and habitat, and behavioral patterns. COLW at 23-26.

Response: I find that the District appropriately documented road densities and addressed impacts from roads.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

The FEIS clearly indicates "open road densities" were used in the analysis for elk, based on requirements from the Forest Plan. FEIS at 208-212 and Forest Plan 4-245 and 4-259. The project proposes to close and decommission roads, which would further reduce road densities.

The objector's assertion that the FEIS concludes that roads do not cause impacts is not supported by fact. Impacts from roads are addressed throughout the FEIS. For example, the elk analysis clearly notes that "Research suggests that elk select areas further away from open roads and the distance band method allows managers to quantify the amount of habitat available to big game at different distances from open roads, whereas the open road density method doesn't quantify the amount of habitat that is away from open roads and therefore providing security habitat for big game." FEIS at 209. The analysis on wolves notes that "High road densities and human presence may limit wolf presence within the Black Mountain project area." FEIS at 161. The soils analysis documents that temporary roads impact soil productivity. FEIS at 86 and 93. The hydrology analysis documents that sediment delivery occurs from existing roads and temporary roads where ground disturbance occurs, while peak flows are influenced by the presence of roads. FEIS at 94, 97 and 98.

Please see the response to Objector Statement #2 for additional information.

Objector Statement #18b: Objector states that data from the Ochoco Summit Trail System Project EIS (which should have been included in this project) indicates that road densities are much higher and should include closed, decommissioned, temporary and reconstructed roads. COLW at 23-26 and 45. Objector believes that the District offered "no logical supportable rationale for why these data were omitted" and believes that omitting these data is a "failure to prepare a transparent, objective, "accurate scientific analysis" using "high quality information" that the Forest developed. COLW at 24-26 and 49-50.

Response: I find that the District included all relevant information on road densities that apply to this project.

The FEIS clearly indicates "open road densities" were used in the analysis for elk, based on requirements from the Forest Plan. FEIS at 208-212. The analysis for Ochoco Summit Trails Project documented both open road densities and open route densities (roads and trails), because the project was proposing to open more roads/trails to motorized use. The Black Mountain Project is not proposing to increase motorized routes; as such, the data from the Ochoco Summit Trails project regarding motorized routes need not be used.

As noted in their comments, the District addressed their concern about revising cumulative effects to remove the Ochoco Summit Project. The District responded stating that "Due to a U.S. District court ruling in January 2019, the Ochoco Summit Trails Project is no longer moving forward. As such, all references and/or analysis of the Ochoco Summit Trails Project were removed from the Black Mountain EIS between draft and final." FEIS at 521.

Temporary roads are also closed to public use via the timber sale contract. As documented in the response to comments, "Forest Service roads are assigned a Maintenance Level (ML) of 1-5 defined by the level of service provided and maintenance required for the road. ML 1 roads are considered "closed" which means they are suitable for nonmotorized uses but closed to motorized traffic and receive minimal custodial maintenance. It is prohibited to possess or operate a motor vehicle on ML 1 roads (36 CFR 261.15) and they are not shown on Motor Vehicle Use Maps (MVUM). ML 2-5 roads are considered "open" which means they are open to motorized traffic and receive varying levels of maintenance depending on the service provided (FSH 7709.59)." FEIS at 521.

During the objection resolution process, the Responsible Official agreed to add data on the density of closed roads in the project area in the final ROD; however, effects to elk from illegal use of closed roads will not be included, as illegal breaches of closed roads are not predictable or measurable. This information does not change the effects analysis in the EIS, which appropriately focused on disturbance and impacts from open roads, in accordance with Forest Plan direction.

Objector Statement #19: Objector states the Responsible Official is "arbitrary and capricious" when using only management level 2-5 roads to determine open road density per square mile and believes that the FEIS underestimates the actual impact of roads on elk, elk security habitat, and calving and rutting requirements. COLW at 49; BMBP at 16.

Response: I find that the Responsible Official followed Forest Plan standards and guides in the HEI model calculations concerning "open" road density. See the responses to Objector Statements #2, #18a and #18b.

Objector Statement #20: Objector states that the District failed "to analyze and fully disclose the direct and indirect environmental effects to all resources in the project area by not including all roads physically

found on the landscape. The FEIS contains incorrect assumptions, misuse of data, and misleading analyses. These analytical failures have triggered violations of the National Environmental Policy Act, National Forest Management Act, and the Travel Management Rule." COLW at 45 and 48-50. Objector believes that the District failed to state how the project complies with the Travel Management Rule specific to new road development. COLW at 50.

Response: I find that the Responsible Official analyzed and disclosed all potential direct and indirect impacts on all resources identified through scoping, and by resources specialists, that would be impacted by implementation of project activities. Potential impacts from roads are documented throughout Chapter 3 of the FEIS. See the response to Objector Statements #2, #18a and #18b.

The objector did not articulate exactly which part of the Travel Management Rule was being violated with this project. The Black Mountain Project does not propose any new permanent road construction. The Travel Management Rule (36 CFR 212) specifically states that temporary roads are "A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road or trail and that is not included in a forest transportation atlas." 36 CFR 212.1. In addition, the Forest completed their Travel Management Project to designate routes in 2011 and completed their Forest-wide Travel Analysis and Sustainable Road System in 2015. As such, I find that the project complies with the Travel Management Rule.

Objector Statement #21: Objector states that compliance with the Motor Vehicle Use Maps (MVUM) and 2011 Travel Management Plan across the Forest is low and that there is a lack of accountability regarding compliance, which leads to impacts the District has not considered. COLW at 48.

Response: I find that the District documented that roads will be closed in the project area to prevent use.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

As stated in the FEIS, "Forest Service roads are assigned a Maintenance Level (ML) of 1-5 defined by the level of service provided and maintenance required for the road. ML 1 roads are considered "closed" which means they are suitable for nonmotorized uses but closed to motorized traffic and receive minimal custodial maintenance. It is prohibited to possess or operate a motor vehicle on ML 1 roads (36 CFR 261.15) and they are not shown on Motor Vehicle Use Maps (MVUM). ML 2-5 roads are considered "open" which means they are open to motorized traffic and receive varying levels of maintenance depending on the service provided (FSH 7709.59)." FEIS at 521. The FEIS states "Road closures proposed in the Black Mountain project would re-designate 17.16 miles of road from Maintenance Level 2 (currently open) to Maintenance Level 1 (closed). Roads closed in the Black Mountain project area would remain on the Forest Service road system but would be closed to motorized use and removed from the MVUM. Physical closure of roads may include placement of barriers such as trees, rocks, berms, or gates. Basic custodial maintenance may be performed to maintain future access, prevent resource damage, or hydrologically stabilize the road. Physical barriers may also be installed or reinforced on roads that are currently Maintenance Level 1 (closed) roads (i.e. closed prior to Black Mountain)." FEIS at 398-399. Resource Protection Measures documented in the FEIS at 432 and 433 discuss physically closing Maintenance Level 1 roads to eliminate motor vehicle use. One of the roads proposed for decommissioning is documented as receiving illegal use. FEIS at 447.

Final Remedies/Resolution for Roads: The District appropriately addressed roads and their associated impacts. As documented in the response to Objector Statement #18b,

During the objection resolution process, the Responsible Official agreed to add data on the density of closed roads in the project area in the final ROD; however, effects to elk from illegal use of closed roads will not be included, as illegal breaches of closed roads are not predictable or measurable. This information does not change the effects analysis in the EIS, which appropriately focused on disturbance and impacts from open roads, in accordance with Forest Plan direction. No other resolutions or remedies are needed.

Wildlife

Overview and Objector's Suggested Remedies: These objection issues focus on the concern that the project will impact wildlife species, including elk and wolves. Another objector is concerned about the impacts to the northern flicker and all special status species. Suggested remedies include revising or preparing a supplemental DEIS that includes the measures described in COLW at 42-43; 66-67 for elk and COLW at 55 for wolves; and BMBP at 6 for the northern flicker.

Objector Statement #22: Objector states that the District failed to "execute the National Forest Management Act and the 1989 Land and Resource Management Plan Standards and Guidelines by not surveying for calving and wallows sites prior to implementation of the Black Mountain Vegetation Management Project. This oversight is also in violation of the duty to take a hard look under the National Environmental Policy Act." COLW at 38 and 41. Objector believes that the District failed to justify why more definitive information is not available to describe the impacts to this Management Indicator Species, asserting the District "unreasonably" scheduled the analysis to a timeframe that did not allow valid or reliable data to be used. COLW at 41.

Response: I find that the District appropriately analyzed and disclosed information regarding survey time for both elk calving and rutting season.

Please see the response to Objector Statement #23.

Objector Statement #23: Objector states the resource protection measures for calving and wallows are not acceptable because surveys cannot take place prior to calving and rutting season, and that failing to survey during a relevant time frames means that the resource protection measures are not effective. COLW at 40-42. Objector states that the District did not identify where known calving or wallow sites are located, or their juxtaposition to proposed treatment units where disturbance to elk habitat is planned and did not include a cumulative impact analysis on roads, cover, calving and wallowing habitat. COLW at 41 and 66-67.

Response: I find that the District analyzed and disclosed information regarding survey timing during both calving and the rutting season. The Responsible Official appropriately provided information regarding the problems associated with wallow and calving locations year to year and provided an analysis of cumulative impacts analysis on the proposed alternative.

The FEIS at 207, 212, and 213 and Biological Evaluation (BE) at 52 and 58 state "Identification of specific calving sites is not possible because they change from year to year because an elk's reproductive strategy is adapted to seasonal fluctuations in forage quantity and quality (Sadlier 1987). Additionally, the timing and location of calving is related to variations in plant phenology, timing of peak forage quality between geographic areas, and the differences in age of the primary sires or cow body condition (Raedeke et. al 2002). Peer reviewed literature describing calving and fawning habitat that is specific enough for GIS analysis does not exist (Wisdom 2018, personal communications)."

The FEIS at 212-213 and 436 discloses standards and guidelines relevant to elk calving sites, which requires the Forest to "Protect the character of elk calving sites (Forest Plan 4-246)" and "Minimize disturbance from human activity during calving season, May 15 to June 30 (Forest Plan 4-246)." The Forest Plan does not require identification of elk caving sites at any specific time prior to implementation. The FEIS then documents "Activities proposed in the Black Mountain project would protect and enhance the character of riparian areas where calving and fawning are likely to occur. Commercial thinning, noncommercial thinning, noncommercial hardwood enhancement, and prescribed fire would improve forage and browse conditions by reducing canopy cover which provides 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 a more consistent source of forage quantity and quality throughout the early spring and late summer. Riparian restoration would occur along 7.7 miles of streams within the project area. It is anticipated that there would be an increase in the forage available as a result of stream restoration activities, as well as improved conditions for existing hardwoods, with the potential for expansion within these areas. Due to the treatments, riparian areas within the project area would become more desirable for calving and fawning." FEIS at 212-213 and BE at 52 and 58.

The FEIS includes Resource Protection Measures (RPMs) and Riparian Habitat Conservation Area (RHCA) prescriptions to protect the character of riparian areas. FEIS at 212-213 and 436 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 in riparian areas (e.g. RHCAs, hardwood stands) that begin during calving season (May 15-June 30) would require surveys prior to implementation to determine if calving elk are present. If calving elk are present, project activities would be postponed until completion of calving season. Project activities implemented in riparian areas (e.g. RHCAs, hardwood stands) that begin before calving season would continue during calving season because disturbance is already occurring, and it is unlikely elk would select these locations for calving." The FEIS at 213 and 436 states that "wallows may occur throughout the project area, but primarily occur near water, in proximity to riparian areas, or where moist, soft ground can be found (e.g. springs and seeps). Identification of specific wallows is not feasible because like calving areas, they may change from year to year based on seasonal fluctuations in forage or availability of water. Bull elk may return repeatedly to the same wallow, but wallows may also be abandoned after one season which makes maintaining an accurate inventory difficult."

The FEIS at 213 and 436 and the BE at 52 and 58 disclose standards and guidelines relevant to elk wallows, which require the Forest to "Protect wallows during rutting season, September 1 to October 15" (Forest Plan 4-246). The Forest Plan does not require identification of elk wallows at any specific time prior to implementation. The FEIS then documents that "Resource Protection Measures (RPMs) are included in project design to protect wallows during rutting season. Project activities that begin during rutting season (September 1-October 15) would require surveys prior to implementation to determine if any wallows are present. If wallows are located, they would be flagged and no activities would be permitted within 0.25 miles of the wallow during the rutting season. Project activities that begin before the rutting season would not require surveys and would continue through the rutting season because disturbance is already occurring, and it is unlikely elk would select these locations for wallows." FEIS at 213 and 436.

The FEIS Response to Comments states that increasing elk security is not part of the purpose and need of the Black Mountain project. FEIS at 515. However, the proposed vegetation management activities will increase forage and improve riparian and hardwood habitat, which is important for calving and fawning.

Connected actions associated with the project such as road closures will reduce the open road density benefitting elk and other big game. Additionally, the HEI value will remain above Forest Plan goals and objectives and the open road density will remain below Forest Plan standards. FEIS at 209.

The FEIS at 208 and the BE at 53-54 describes the Habitat Effectiveness Index model (HEI). The FEIS at 213-214 and the BE at 58-59 describes the cumulative effects analysis for proposed Alternatives 2 and 3, which states that "The cumulative effects boundary includes the three subwatershed that fall within the Black Mountain project boundary. All past, present and reasonably foreseeable future actions in Table 28 have been considered for their cumulative effects on elk, mule deer, and their habitat. Past and present management activities that have affected elk habitat within the project area include: Harvest activities, road construction, fire suppression, and livestock grazing. Past harvest activities have led to the existing road densities, cover values, and HEI values referred to in the existing condition."

In order to partially resolve the objector's concerns, the Responsible Official has agreed to drop several units located in RHCAs to minimize the potential to disturb calving elk. Additionally, RPM #52 will be modified to state "Project activities in riparian areas (e.g. RHCAs, hardwood stands) that begin during calving season (May 15-June30) would require surveys two weeks prior to implementation to determine if calving habitat is present. If habitat is present, project activities would be postponed until completion of the calving season." These changes will be incorporated into the final decision.

Objector Statement #24: Objector states the District failed to describe appropriate effectiveness monitoring, which means the District cannot protect the character of elk habitat or adaptively manage it to minimize disturbance. COLW at 41-42.

Response: After a review of the comment letters submitted by the objector, I find that this objection issue was not previously raised in comments. As such, in accordance with the regulation at 36 CFR 218.10(a)(4), this issue need not be addressed. Regardless, I find that the District provided for pre-implementation surveys for elk in order to protect key habitat features, as disclosed in the response to Objector Statement #23.

Objector Statement #25: Objector states that the District failed to adequately analyze cumulative effects on Rocky Mountain elk and failed to disclose the significance of road development and use, reductions in canopy cover and tree density, and prescribed fire effects to security habitat across the entire forest. COLW at 65-67.

Response: I find that the FEIS appropriately analyzed for cumulative effects on elk/elk security habitat.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

The FEIS at 213-213 describes the potential cumulative effects on Rocky Mountain elk stating that "All of the past, present and reasonably foreseeable future actions in Table 5 have been considered for their cumulative effects on elk, mule deer, and their habitat. Past and present management activities that have affected elk habitat within the project area include: Harvest activities, road construction, fire suppression, and livestock grazing. Past harvest activities have led to the existing road densities, cover values, and HEI values referred to in the existing condition."

The FEIS at 214 documents the conclusion, stating that "Road closures and decommissioning would increase the amount of big game security in the project area and vegetation and fuels management

activities would increase forage throughout the project area. Unfortunately, the benefits of road closures and forage enhancement may not outweigh the decrease in cover and increased disturbance associated with project activities. This is a result of the road closures not occurring in big enough tracts of land that are recommended to provide elk security and thus the increased forage not being as accessible while being secure at the same time. The Black Mountain project is managing towards HRV and thus reducing cover. Although cover would be reduced, cover standards within each Management Area would remain above Forest Plan standards in each alternative (Table 63). The Black Mountain project would result in a decrease in habitat capability or carrying capacity as reflected in a decrease in HEI. Although reduced, all HEI values would remain above Forest Plan standards in each alternative (Table 63). The Black Mountain 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."

During the objection resolution process, the Responsible Official clarified that while the project temporarily impacts cover, vegetation management would occur on 45% of the forested areas in the project area, leaving 55% untreated, that the activities would occur over a 2-10 year period, leaving some cover intact throughout implementation, and that dropping certain RHCA units from the proposal would also maintain additional cover. This information will be included in the final ROD.

Objector Statement #26: Objector states that the District's conclusion that the project "may affect, not likely adversely affect" the gray wolf was arbitrary and capricious and that they failed to take a hard look at impacts to wolves and their habitat. COLW at 53-55. Objector BMBP is concerned that the Forest is not adhering to the intent and management guidance of the Endangered Species Act as it applies to the threatened gray wolf. BMBP at 19.

Response: I find that the District addressed potential impacts to wolves and their habitat and are adhering to the intent and management guidance of the Endangered Species Act (ESA) as it applies to the gray wolf.

Section 7 of the ESA requires the agency to consult with the US Fish and Wildlife Service on actions that may impact listed species.

The FEIS at 161-163 provides a detailed discussion of effects to the gray wolf. The Biological Evaluation (BE) prepared for the Black Mountain project found that the project "may affect, but not likely to adversely affect" gray wolf therefore informal consultation with USFWS was initiated in September 2018. Informal consultation was conducted and a Biological Assessment (BA) was prepared and reviewed by the USFWS. A letter concurring with the effects determination in the BA was received from the USFWS on June 19, 2019. The BA at 10-11 states that the Forest determined that the proposed action May affect but would not likely adversely affect gray wolves for the following reasons: "no denning or rendezvous sites occur on the Ochoco; no known areas of wolf activity are designated on the Ochoco; security habitat for wolves would potentially increase as a result of road closures; implementing vegetation and prescribed burning activities may cause big game to change their use patterns, which may change the use patterns for wolves. However, the scale of displacement is small and discountable in comparison to the normal range and movements of wolves and prey species; disturbance to wolves when implementing vegetation and prescribed burning activities may temporarily displace or effect the behavior of dispersing wolves. However, the scale of most management activities on the Forest is small in comparison to the normal range and movement of wolves. Therefore, wolves may avoid or not be present in a particular area during activities, but this is likely to have discountable effects to wolves due to their wide-ranging behavior." This is also documented in the FEIS at 163-164.

Objector Statement #27: Objector BMBP is concerned that the Forest is not adhering to the intent and management guidance of the Endangered Species Act as it applies to the following species: Sensitive-listed Columbia spotted frog and redband trout; vulnerable-ranked American marten; Sensitive-listed Pacific fisher and wolverine; Sensitive-listed plant species; and northern goshawk. BMBP at 19-22.

Response: Please see the response to Objector statement #10. Sensitive plants are adequately addressed in the FEIS at 238-273.

Objector Statement #28: Objector states that the EIS inaccurately analyzed "for direct, indirect, and cumulative effects to Northern Flicker from the two action alternatives by focusing only on LOS juniper as suitable habitat and failing to take into consideration much more recent best available science showing that Northern Flicker select for large Ponderosa pines and would therefore be negatively affected by mature tree logging planned that would greatly reduce the abundance of future large Ponderosa pines, including large Ponderosa pine snags." BMBP at 6.

Response: I find that the FEIS accurately documented effects to the Northern Flicker based on standards and guidelines set forth in the Forest Plan.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

Impacts to northern flicker were addressed according to standards and guidelines set forth in the Forest Plan. According to the FEIS at 204-205, "Forest-wide standards and guidelines of the Forest Plan directs land managers to "protect habitat from adverse modification through curtailment of conflicting activities, modification of activities, seasonal restriction of activities, or avoiding the area" if the species use of the area is because it is essential habitat for that species. Neither action alternative in the Black Mountain Project proposes removal of old growth juniper; as such, all alternatives are consistent with the Forest Plan.

In addition, the FEIS notes that while northern flicker are observed in almost all forest types, the flicker is a management indicator species for old growth juniper habitat, which is why the analysis focused on that habitat. FEIS at 204. This is reiterated in the response to comments. FEIS at 510.

Objector Statement #29: Objector states EIS violates NFMA by not following guidelines for deer and elk winter range and wildlife connectivity corridors. BMBP at 9 and 16. Objector strongly objects to commercial logging and excessive "non-commercial" logging in wildlife connectivity corridors. BMBP at 14.

Response: I find that the EIS documents how the project complies with NFMA and that it adequately addressed winter range and wildlife connectivity corridors.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

Full analysis of connectivity corridors can be found in the FEIS at 225-228. As documented in the FEIS, at most there would be 217 acres of thinning/tree removal activities in the 1,550 acres of connectivity corridors, which equates to about 14% of the identified corridors being treated. The treatments are designed to maintain or enhance the development of large tree structure. As such, connectivity corridors would be maintained in accordance with the Eastside Screens direction. FEIS at 225-228. A full analysis of elk and mule deer can be found in the FEIS at 205-214. The response to comments also addressed this issue. FEIS at 511-518.

Objector Statement #30: Objector is concerned that the District violated the Forest Plan protection guidance for the northern goshawk under the Eastside Screens requirements. BMBP at 9.

Response: I find that the Forest in consistent with Forest Plan standard and guidelines and followed the Eastside Screens direction.

The FEIS at 220 documents that "In 1995, the Regional Forester's Eastside Forest Plans Amendment 2 (Eastside Screens) amended the Forest Plan. This amendment included interim management guidelines for northern goshawk specific to timber sales. The northern goshawk is a raptor and the Forest Plan provides guidance for: the protection of nests, the protection of habitat surrounding nests, and minimizing disturbance to nesting individuals." The FEIS at 220-221 documents the minimum standards for protection of the species.

The BE at 67-70 and the FEIS at 225 both state that "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 would be implemented with seasonal restrictions. Seasonal restrictions would be employed for disturbance activities within ½ mile of known nest sites, from March 1 to September 30 of each year. These restrictions may be waived on a case-by-case basis, if appropriately timed monitoring indicates that the nest area is not reproductive during that nesting season. This assessment cannot be made until well into the nesting season. Waivers would only be valid for the year in which they are granted. Both action alternatives considered in the Black Mountain project are consistent with the Forest Plan, as amended by the Eastside Screens." Thus, because the project complies with the standards for protecting northern goshawk, there is no violation of the Eastside Screens.

Objector Statement #31: Objector is concerned that the EIS did not include adequate cumulative effects analysis for the reductions of suitable habitat for MIS and special status species. BMBP at 9.

Response: I find that the EIS provided adequate cumulative effects analyses for the management indicator and special status species.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

Effects are fully analyzed with a complete description for both sensitive species and management indicator species on the Ochoco National Forest in the FEIS at 160-185 for sensitive species and 185-214 for management indicator species, and in the BE at 9-30 for sensitive species and 30-59 for management indicator species. Cumulative effects are addressed in both documents.

Objector Statement #32: Objector is concerned that the EIS did not adhere to the Eastside Screens protections for northern goshawks. BMBP at 13.

Response: Please see the response to Objector Statement #30.

Final Remedies/Resolution for Wildlife: The FEIS adequately documented potential impacts to wildlife species and the Forest consulted with the US Fish and Wildlife Service as required. During the objection resolution process, the Responsible Official clarified that while the project temporarily impacts cover, vegetation management would occur on 45% of the forested areas in the project area, leaving 55%

untreated, that the activities would occur over a 2-10 year period, leaving some cover intact throughout implementation, and that dropping certain RHCA units from the proposal would also maintain additional cover. This information will be included in the final ROD. No other remedy or resolution is needed.

Forestry

Overview and Objector's Suggested Remedies: These objections issues focus on the concern that the EIS does not disclose effects of the proposed logging on dead wood habitat and large unfragmented habitat blocks and that the EIS failed to consider alternatives that retain more basal area. Another objector was concerned that the District did not analyze an alternative that would have allowed for removal of large grand fir > 21" from the immediate vicinity of legacy old growth ponderosa pine without a plan amendment. This objector's suggested remedy is to analyze an alternative that removes large (>21" DBH), young (<150 years) shade tolerant (grand & Douglas-fir) trees from the area 1.5 times the dripline of old growth ponderosa pine within the 2,134 acres of multi-strata Late and Old Structure (LOS).

Objector Statement #33: The objector is concerned that the final EIS analysis failed to "disclose the effects of logging under each alternative on snag recruitment over time relative to the current and reference conditions and other dead wood habitat goals informed by DecAID and other science." OW at 3. BMBP at 17.

Response: I find that the responsible official accurately analyzed for each alternative on snag and down wood recruitment using DecAID.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

The DecAID analysis described in full detail in the FEIS at 186-198 and in the BE at 31-42. The FEIS at 186 states that "Primary cavity excavators were selected to serve as an indicator for species that are dependent upon standing and down 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."

The FEIS at 186 goes on to state that "Because these MIS were selected to represent dead and defective wood habitat, this analysis and discussion focuses primarily on that habitat component. Additional information on cavity-excavating birds' habitat associations, distribution and life history requirements is summarized in Mellen-McLean (2012*a*)."

The FEIS at 187 describes the rationale for the use of DecAID, noting that "Current Forest Plan direction, as amended by the Eastside Screens, is to maintain snags at 100% of biological potential for all primary cavity excavator species that occur on the Forest. Rose et al. (2001) reports that results of monitoring indicates that the biological potential models are a flawed technique. New information about the ecology, dynamics, and management of decayed wood has been published since then, and the state of the knowledge continues to change. However, until the Forest Plan is amended to reflect the new science, 100% biological potential is the minimum number of snags that need to be maintained through the life of the stand rotation. "

Finally, the FEIS at 187 states that "Integration of the latest science is incorporated into this analysis using DecAID version 3.0 (Mellen-McLean et al. 2017) which is an internet-based summary, synthesis, and

integration (a "meta-analysis") of the best available science: published scientific literature, research data, wildlife databases, forest inventory databases, and expert judgment and experience."

The FEIS goes on to discuss the use of DecAID and the potential impacts from the project. Direct and indirect effects are disclosed for all alternatives in the FEIS at 196-198, while cumulative effects are disclosed in the FEIS at 198.

During the objection resolution process, the Responsible Official agreed to consolidate snag recruitment information, including displaying the information relative to the current and reference conditions. This information will be displayed in the final ROD.

Objector Statement #34: The objector is concerned that the final EIS analysis failed to "disclose the effects of logging and road building on the natural range of large unfragmented habitat blocks." OW at 3.

Response: See the response to Objector Statements #14 and #15.

Objector Statement #35: The objector is concerned that the final EIS failed to consider alternatives that retain more basal area. OW at 6-7.

Response: I find that the Responsible Official utilized best available science to determine the amount of retained trees to meet purpose and need and provided a range of alternatives based upon identified key issues.

The regulation 40 CFR 1502.14(a) requires consideration of all reasonable alternatives to the proposed action.

The objector stated the FEIS failed to consider alternatives that retain more basal area in order to store carbon, protect wildlife cover, and recruitment snag habitat over time. In their original comments during the 2017 scoping period they did "...urge the agency to retain at least 60-120 ft2/acre of basal area. 30-40 ft2/acre might be OK in small patches within units as part of a variable prescription, but the average over a unit must be much higher than that in order to ensure adequate cover for wildlife, and adequate dead wood recruitment through time" (OW at 28). The subsequent objection letter in 2019 (OW at 6) stated "Where there are lots of small trees we recommend variable density thinning to 60-80 sq ft/acre basal area, retaining the largest trees that will become the next generation of old growth. Since larger trees have a higher ratio of basal area to leaf area, sites with abundant large trees can sustain higher basal areas, and we recommend retaining 100-140+ sq ft/acre".

The FEIS at 44-45 and 393-394 disclosed that several documents were used in developing the variable density thinning prescriptions. The proposed variable density thinning "...is intended to generally follow the guidelines provided in *Restoration of Dry Forests in Eastern Oregon* (Franklin et al. 2013) and the stand scale recommendations contained in the *OFRC Dry Forest Restoration Recommendations* developed by the Ochoco Forest Restoration Collaborative (2017)." In addition, the FEIS states that the recommended stocking levels vary depending on site quality, tree size and species and recommended stocking levels and are derived from *Suggested Stocking Levels for Forest Stands in Northeastern Oregon and Southeastern Washington: An Implementation Guide for the Umatilla National Forest* (Powell, 1999). This document looks at optimum stocking levels not only for stand growth, but also considerations for forest health issues such as insect and disease susceptibility. Thus, the FEIS demonstrates that the IDT developed prescriptions based upon guidelines for dry forests in Eastern Oregon.

During the objection resolution process, the Responsible Official clarified with the objectors that vegetation management activities, including thinning and burning, would only occur on 45% of the forested areas in the project area, leaving 55% of forested areas in the project area untreated, providing for future snag recruitment. This information will be communicated in the final ROD and be included in the implementation plan.

Objector Statement #36: The objector is concerned that the District did not analyze an alternative that would have allowed for removal of large grand fir > 21" from the immediate vicinity of legacy old growth ponderosa pine without a plan amendment. The objector doesn't believe that the 1995 memo referenced in the FEIS is consistent with other memos nor the Eastside Screens. AFRC at 1.

Response: I find that the Responsible Official appropriately applied the Eastside Screens and the development of an alternative that allowed the removal of trees >21" would, in fact, require a Forest Plan amendment.

The revised Continuation of Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales, known as the Eastside Screens, amended the Ochoco National Forest Plan in 1995 and remains applicable today. The regulation 40 CFR 1502.14(a) requires consideration of all reasonable alternatives to the proposed action.

THE FEIS at 47-48 and 373-376 describes the process and standards and guidelines used to determine that Scenario A of the Eastside Screens is the appropriate strategy for this project and the 21" rule is applicable. The FEIS Appendix G at 484-486 in Response to Comments addressed the concern from AFRC that the Regional Forester's Forest Plan Amendment #2 (i.e. Eastside Screens) is not a blanket restriction on commercial harvest of trees greater than 21" DBH. Rather, it presents an analysis process for determining when and where timber harvest (including the harvest of trees >21" DBH) is appropriate to protect and enhance late and old structure while protecting other values, including wildlife. Thus, the Forest to perform this analysis process to determine when and where the selective harvest of trees greater than 21" DBH is appropriate and allowed under the Eastside Screens. The response to comment acknowledges there could be some ambiguous wording in Amendment #2 on whether one can deviate from the 21" rule and cited references to three Eastside Screens Oversight Team review letters that provide clarification and additional interpretation of harvest of trees >21 inches diameter. The FEIS at 484 states that "After the Eastside Screens were issued in 1995, the PNW Regional Forester appointed an Eastside Screens Oversight Team and charged the team with reviewing and monitoring Eastside Screens implementation. The team's objective was to ensure that the Eastside Screens were being applied consistently across all Eastside national forests. Additionally, the Oversight Team provided clarification and interpretation of the Eastside Screens by periodically reviewing timber sale projects on each national forest, producing a letter describing their findings, and then circulating the letter to other Eastside national forests." The FEIS at 484 goes on to say, "These reviews, signed by the Regional Forester or the Director of Natural Resources, are considered administrative direction for Eastside Screens implementation and are applicable to all Eastside national forests," referencing a USDA white paper Powell, D.C., 2013. Eastside screens chronology. F14-SO-WP-SILV-53. USDA, Forest Service, Pacific Northwest Region.

The response summarized the third letter, dated November 14, 1995, which was a review of Eastside Screens implementation on the Umatilla National Forest. The letter states: "For additional clarification, the screen direction under Scenario A of the wildlife standard is intended to maintain all live trees >21 inches regardless of tree species and regardless of whether a stand is LOS or not. The existing wording in Scenario A could be erroneously interpreted to mean that large trees >21 inches "could" be cut in LOS in some instances. We regret the ambiguous wording used in writing Amendment #2."

Objector Statement #37: The objector objects to any type of arbitrary diameter limits for any species including juniper, grand fir, Douglas-fir and ponderosa pine because it does not allow resource professionals to have latitude to make site specific decisions on the ground in order to adequately meet the purpose and need of the project. AFRC at 2.

Response: I find the Responsible Official properly used design features to meet the project's purpose and need.

The revised Continuation of Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales, known as the Eastside Screens, amended the Ochoco National Forest Plan in 1995 and remains applicable today.

The FEIS notes in several places the diameter limit in the action alternatives is not arbitrary but is based upon Forest Plan standards and guidelines. The FEIS at 24 and 482 states that The Regional Forester's Forest Plan Amendment #2 (Eastside Screens) prohibits the commercial removal of trees greater than or equal to 21 inches DBH, regardless of age. The FEIS at 375 identifies consistency with Forest Plan standards and guidelines by stating that the project will maintain all remnant late and old seral and/or structural live trees ≥21" DBH that currently exist within stands proposed for harvest activities. Please see the response to Objector Statement #36 for additional details.

Objector Statement #38: Objector is concerned that leaving out the selective harvest of greater than 21" shade tolerant trees in specific circumstances where they imperil old legacy pine trees does not meet the Black Mountain purpose and need to move the existing condition of these areas toward historic conditions in dry forests in the project area (historic range of variability) and does not follow best available science regarding dry forest restoration. AFRC at 3.

Response: I find the Responsible Official determined that the action alternatives do meet purpose and need and that the District used best available science to develop thinning prescriptions.

The FEIS discusses in several sections how the proposed actions would move the existing condition of dry forests toward historic conditions in the project area. The FEIS at 44-45 describes how variable density thinning in Alternatives 2 and 3 would be used to restore characteristic (i.e. historic) dry forest composition, structure, and density in overstocked stands by targeting the removal of young trees (up to 20.9" dbh) and leaving the largest trees and how the overall species diversity would be retained after harvest, but the proportion of early seral/fire tolerant species would increase. In addition, the FEIS at 376 states that thinning would be used to move stands towards late and old structure (LOS) by removing generally smaller trees, trees of fire intolerant species, reduce disease severity if present, and improve the resiliency of remnant large and/or old trees. Thus, the action alternatives do meet purpose and need.

The FEIS at 44-45 identifies that proposed variable density thinning is intended to generally follow the guidelines provided in *Restoration of Dry Forests in Eastern Oregon* (Franklin et al. 2013). This guide represents the authors' best current thinking about dry forest restoration, but it does recognize that it is a work in progress. Thus, the District used the best available science when developing the thinning prescriptions.

Considerations regarding harvesting trees greater than 21" is addressed in the development of an alternative considered but eliminated from further study and in Response to Comments. FEIS at 24 and 482). As explained in the response to Objector Statement #36, harvesting trees greater than 21" requires a

forest plan amendment. FEIS at 24 explains why the Responsible Official determined that a project specific forest plan amendment was not applicable for this project.

Objector Statement #39: Objector is opposed to any reduction of commercial thinning acres in these projects. AFRC at 3.

Response: I find the Responsible Official did not reduce commercial thinning acres.

The Objector was concerned about the statements in the FEIS at 7 within the section titled "Modifications to the Proposed Action". In particular, the statement "Minor modifications include reduction of acres of commercial thinning...". The objector stated that originally, Alternative 2 proposed to implement commercial thinning on 4,645 acres with an additional 442 acres within riparian areas; the FEIS still proposes 4,646 acres of thinning, with 442 acres of thinning in RHCAs, so there is no reduction of commercial thinning between DEIS and FEIS. As noted in the FEIS at 7, minor reductions in estimated acres occurred as the result of additional field analysis, updated LiDAR and GIS mapping information.

Objector Statement #40: Objector objects to the elimination of commercial treatments in the RHCAs. AFRC at 3.

Response: I find the Responsible Official appropriately developed an alternative that eliminated commercial thinning in RHCA's based upon a key issue.

The regulation 40 CFR 1502.14(a) requires consideration of all reasonable alternatives to the proposed action.

The FEIS at 18 describes the process used for development of issues in response to the proposed action to provide focus as well as influence alternative and resource protection measure development. The FEIS at 18 describes how one key issue emerged from this process: "Concern that logging in Riparian Habitat Conservation Areas (RHCA) would violate the Inland Native Fish Strategy (INFISH), especially with regard to attainment of Riparian Management Objectives (RMO). Logging in RHCAs would violate the Clean Water Act by exacerbating water quality criteria impacts for which 303(d) streams were listed and/or violating subsequent Total Maximum Daily Loads (TMDL) and water quality plans." As a result, Alternative 3 was developed in response to this issue and eliminates commercial thinning, skid roads, and landings in all RHCAs in the project area. FEIS at 21.

Final Remedies/Resolution for Forestry: The FEIS disclosed the effects of the proposed project on dead wood habitat and large unfragmented habitat blocks and documented the rationale for basal area retention. In addition, the FEIS documented why trees over 21 inches would be retained, and documented consideration of an alternative that would harvest larger trees, which was ultimately eliminated from detailed study. As documented in the response to Objector Statement #33, during the objection resolution process, the Responsible Official agreed to consolidate snag recruitment information, including displaying the information relative to the current and reference conditions. This information will be displayed in the final ROD. As documented in the response to Objector Statement #35, during the objection resolution process, the Responsible Official clarified with the objectors that vegetation management activities, including thinning and burning, would only occur on 45% of the forested areas in the project area, leaving 55% of forested areas in the project area untreated, providing for future snag recruitment. This information will be communicated in the final decision. No other remedy or resolution is needed.

Climate Change

Overview and Objector's Suggested Remedies: These objection issues focus on the concern that the FEIS did not consider logging as a contributor to climate change. Suggested remedy is to withdraw the project.

Objector Statement #41: The objector is concerned that the impacts associated with the proposed vegetation treatments aren't recognized in the EIS as contributing to climate change. OW at 3. BMBP at 23.

Response: I find that the Forest adequately addressed the impacts of proposed logging on climate change.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action. Current direction for addressing climate change issues in project planning and the NEPA process is provided in the document Climate Change Considerations in Project Level NEPA Analysis (USDA 2009).

As documented in the FEIS, the proposed action would affect 6,486 acres of forest by commercially thinning and non-commercially thinning smaller trees from the stand. The FEIS documents that "Climate change is a global phenomenon because major greenhouse gasses (GHG) mix well throughout the planet's lower atmosphere (IPCC 2013). Considering emissions of GHG in 2010 was estimated at 49 ± 4.5 gigatonnes globally (IPCC 2014) and 6.9 gigatonnes nationally (US EPA, 2015), a project of the magnitude of the Black Mountain Vegetation Management Project makes an infinitesimal contribution to overall emissions. Therefore, at the global and national scales, this proposed action's direct and indirect contribution to greenhouse gasses and climate change would be negligible. In addition, because the direct and indirect effects would be negligible, the proposed action's contribution to cumulative effects on global greenhouse gasses and climate change would also be negligible." FEIS at 356.

The FEIS further documents that "The project is in line with the suggested practice of reducing forest disturbance effects found in the National Climate Assessment for public and private forests (Joyce et al. 2014). Here specifically, the project proposes to reduce stand densities to increase resistance to drought and insect mortality; use prescribed fire and thinning to increase resistance and resilience to wildfire; and thin overstocked stands to make more growing space and resources available to the remaining trees, resulting in decreased tree stress and development towards larger diameter stands. The release of carbon associated with this project is justified given the overall change in condition increases forest resistance to release of much greater quantities of carbon from wildfire, drought, insects/disease, or a combination of these disturbance types (Millar et al. 2007). This project falls within the types of options presented by the IPCC for minimizing the impacts of climate change on forest carbon and represents a potential synergy between adaptation measures and mitigation. Actions aimed at enhancing forest resilience to climate change by reducing the potential for large-scale, catastrophic disturbances such as wildfire also prevents release of GHG and enhances carbon stocks (Smith et al. 2014). The proposed action reflects the rationale behind these recommendations because it would improve stand conditions, diversity, density, and structure, allowing the forest to adapt, persist, and function better over time and into the future." FEIS at 357.

Objector Statement #42: The objector is concerned that the EIS failed to "recognize the climate impacts of carbon emissions from forest degradation are just as bad as carbon emissions from deforestation." OW at 3.

Response: I find that the District adequately addressed project impacts on carbon emission, carbon storage and climate change.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action. Current direction for addressing climate change issues in project planning and the NEPA process is provided in the document Climate Change Considerations in Project Level NEPA Analysis (USDA 2009).

The FEIS at 356-357 states that the Intergovernmental Panel on Climate Change summarized contributions to climate change of global human activity sectors in its Fifth Assessment Report (IPCC 2014) and found that in 2010, anthropogenic (human-caused) contributors to greenhouse gas emissions came from several sectors, including industry, transportation, and building (41%); energy production (35%); agriculture (12%); and forestry and other land uses (12%). The FEIS at 357 also documented that "There is agreement that the forestry sector contribution has declined over the last decade (IPCC, 2014; Smith et al., 2014; FAOSTAT, 2013). The main activity in this sector associated with GHG emissions is deforestation, which is defined as removal of all trees, most notably the conversion of forest and grassland into agricultural land or developed landscapes (IPCC 2000)."

The FEIS documents the conclusion that "This Black Mountain Vegetation Management project does not fall within any of these main contributors of greenhouse gas emissions. Forested land would not be converted into a developed or agricultural condition. In fact, forest stands are being retained and thinned to maintain a vigorous condition that supports trees and sequesters carbon long-term." FEIS at 357.

Finally, the FEIS documents that for the Black Mountain Project, "here specifically, the project proposes to reduce stand densities to increase resistance to drought and insect mortality; use prescribed fire and thinning to increase resistance and resilience to wildfire; and thin overstocked stands to make more growing space and resources available to the remaining trees, resulting in decreased tree stress and development towards larger diameter stands. The release of carbon associated with this project is justified given the overall change in condition increases forest resistance to release of much greater quantities of carbon from wildfire, drought, insects/disease, or a combination of these disturbance types (Millar et al. 2007)." FEIS at 357.

Objector Statement #43: The objector is concerned that the EIS failed to "recognize that carbon emissions from logging intended to reduce natural disturbance is more likely to increase than decrease total carbon emissions from logging and natural disturbance." OW at 3.

Response: I find that the District adequately addressed project impacts on carbon emissions and described short-term and long-term tradeoffs.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action. Current direction for addressing climate change issues in project planning and the NEPA process is provided in the document Climate Change Considerations in Project Level NEPA Analysis (USDA 2009).

The EIS at 357 states that the Black Mountain Vegetation Management project does not fall within any of the main contributors of greenhouse gas emissions. Forested land would not be converted into a developed or agricultural condition but are instead being retained and thinned to maintain a vigorous condition that supports trees and sequesters carbon long-term.

See also the responses to Objector Statements #41 and #42.

Objector Statement #44: The objector is concerned that the EIS failed to "recognize that logging does not increase the capacity to grow trees at the stand scale and logging does reduce carbon emissions." OW at 3.

Response: I find that the Forest adequately addressed project impacts on carbon emission, carbon storage and climate change. See the responses to Objector Statements #41, #42, and #43.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action. Forest Service policy requires the Forest to document the project's effects on climate change and the effect of climate change on the project.

The FEIS at 356-357 describes the project's potential impacts on climate change, including impacts to carbon and greenhouse gasses (GHGs). The FEIS at 528 documents that this project falls within the types of options presented by the IPCC for minimizing the impacts of climate change on forest carbon and represents a potential synergy between adaptation measures and mitigation. Actions aimed at enhancing forest resilience to climate change by reducing the potential for large-scale, catastrophic disturbances such as wildfire also prevents release of GHG and enhances carbon stocks (Smith et al. 2014). The proposed action reflects the rationale behind these recommendations because it would improve stand conditions, diversity, density, and structure, allowing the forest to adapt, persist, and function better over time and into the future.

Objector Statement #45: Objector states that the District overlooked the potential cumulative effects of trends in climate change, stating that the FEIS only included a narrow contribution to greenhouse gasses from thinning, fire and insect resilience and forest influences on carbon dioxide sequestration. Objector states that climate change was not included as a reasonably foreseeable future action and none of the analyses addresses climate change impacts and trends. COLW at 59-60.

Response: I find that the Forest adequately addressed the potential cumulative effects of trends in climate change and that current and future impacts of climate change were addressed in numerous analysis in the FEIS.

See the responses to Objector Statements #41, #42, #43, and #44 for disclosures concerning potential cumulative effects of the project on climate change.

Although not listed as a project in the reasonably foreseeable future actions table in the FEIS at 34, current and future impacts associated with climate change were analyzed and disclosed by multiple disciplines in the FEIS at 71, 124, 128, 130, 132, 147, 153, 154, 183, 236, 246, 356, and 357.

Final Remedies/Resolution for Climate Change: The District complied with current guidance on addressing climate change; no remedy or resolution is needed.

Aquatic Resources

Overview and Objector's Suggested Remedies: These objection issues surround the objector's concerns over impacts to aquatic resources and the failure to use data important to understanding the analysis and conclusions. Suggested remedies by Objector COLW include: including the relevant data and information in a supplemental DEIS or revised DEIS that includes all fourteen measures noted in their objection at 16-17 and 33-35.

Objector Statement #46: Objector also states that the District did not address the cumulative effect of livestock grazing within RHCAs on vegetation management or soils under any alternatives in the analysis of aquatic biota-related effects. COLW at 64-65.

Response: I find that the IDT addressed the cumulative effect of livestock grazing within RHCAs in the analysis of aquatic biota-related effects.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

Livestock grazing is an ongoing activity permitted and analyzed in allotment management plans. Limiting livestock grazing is outside the scope of this project. However, five grazing actions are included in the project area-wide Cumulative Effects Analysis Table (FEIS at 35-36). In the Forested Vegetation section, livestock grazing in RHCAs is addressed under existing conditions (FEIS at 55). The Soils section addresses livestock management under detrimental soil conditions existing conditions as a management-related disturbance (FEIS at 84). The Aquatic Biota section discusses grazing effects as part of existing conditions from past and current management (FEIS at 123, 127, 130), and specifically for RHCA vegetation ecology in existing and effects sections in FEIS at 146-147, 149. In considering cumulative effects of this project the Aquatic Biota section identifies one allotment management plan with which effects of this project would overlap (FEIS at 151-152; cumulative effects for RHCA vegetation ecology in FEIS at 153).

Objector Statement #47: Objector states that the FEIS failed to "take a hard look by omitting pertinent stream data, inadequately analyzing sediment and other stream parameters, and demonstrating noncompliance with applicable standards and guidelines." COLW at 1 and 8.

Response: I find that the FEIS did not omit pertinent data.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action. The regulation at 40 CFR 1502.24 mandates professional and scientific integrity for an EIS.

The stream data that includes stream temperature and flow analysis can be found in the FEIS at 94; 112-117; 127-128; 130-131; 132-133; 364; 501-502. Sediment analysis is outlined in the FEIS at 94; 102-112; 129; 131-132; 133-134; 364; 382; 429; 431-435; 497-501. Stream temperature data is extensive and a full analysis of the direct and indirect effects of shade, the relationship of temperature to groundwater, topography and surface area is presented in the FEIS at 112.

The assessment required by the Ochoco National Forest Land and Resource Management Plan to determine the effects of peak flow from timber harvest via Equivalent Harvest Area was used on each watershed. A detailed description of the model used for EHA analysis is included in the Black Mountain project record. A sediment yield analysis was performed using the Water Erosion Prediction Project (WEPP) model outlined in the FEIS at 94-119. In the Draft Environmental Impact Statement (DEIS), 200 feet was selected for the sediment delivery zone (SDZ) for the Black Mount project area because of the scab stringer landscape, the quantity of gentle "rolling" terrain and low angle slopes, and non-channelized nature of the sediment delivery. Upon review of public comments received on the DEIS and further review of the Black Mountain Hydrology report, the Responsible Official decided to reanalyze sediment yield for the Black Mountain Project. The updated sediment yields were analyzed with a 300-foot SDZ as requested in public comments received on the DEIS.

Applicable standards and guidelines for stream data, analysis of sediment and other stream parameters were shown to be met in the FEIS at 117.

Objector Statement #48a: Objector states that the District failed to adequately respond to their comments and concerns about impacts to riparian areas, streams and wetlands, and the project's effects on sediment, shade, stream temperature, large woody material, and how the project meets INFISH standards. COLW at 4-14.

Response: I find that the District responded to comments and concerns and disclosed the project's effects on sediment, shade, stream temperature, large woody material and how the project meets INFISH standards.

The regulation at 40 CFR 1503.4 requires the agency to respond to comments on a DEIS.

The FEIS responses to comments on the DEIS in Appendix G (FEIS 479-530) includes sections for Historic Range of Variability (for RHCA, Comment 37), Sediment (Comments 50-60), Shade/Temperature (Comments 61-66), riparian areas and RHCAs (Comments 67, 72-80), and Stream Restoration that includes large woody debris (Comments 81-82). Comments related to INFISH are in Comment 72 and included in these other responses. Proposed treatments are designed to maintain, restore and enhance wet areas and wetlands through specific design features in customized RHCA prescriptions, resource protection measures and best management practices (project consistency summary, FEIS at 364).

Sediment is expected to have a short-term (5-8 years) increase of delivery but within the magnitude of existing impacts to aquatic biota and their habitat due to relatively small spatial scale, intermittent nature of treatments, and application of BMPs and RPMs (FEIS at 134), with a long-term (over 10 years) reduction in potential delivery from existing condition where high intensity wildfires are not widespread. With widespread high intensity wildfires, project activities would improve conditions in both the short- and long-term (FEIS at 134). Sediment is addressed in the FEIS at 94 (WEPP); 102-112 (sediment delivery, existing conditions and consequences); 118 (summary); 129, 131-134 (related to aquatic biota); 362 (project consistency summary); 429, 431-435 (BMPs and RPMs for soils, water quality and aquatics).

Shade/Temperature are also addressed in the FEIS, which documents that in the short-term (<5 years), minor localized amounts of shade would be reduced, with long-term (>5-10 years) indirect benefits to shade and stream temperature from general RHCA condition improvement and increased shade from hardwoods (FEIS at 118). Proposed activities are designed to improve attainment of RMOs while also not expected to measurably increase water temperatures in the short and long-term due to decreases in shade being localized and of small magnitude (FEIS at 118, 133). Of the 0.90 mile of the 25 miles within the potential shade zone with commercial harvest, 0.14 mile contains water during critical times (FEIS at 119). The District developed site-specific prescriptions for units that have potential shade concern, and efforts were made to ensure activities did not occur or were minimal within the primary shade zone of live water reaches (FEIS at 113). Shade/Temperature is addressed in the FEIS at 94 (WEPP); 112-117 (stream temperature existing conditions and consequences); 127-128 (existing condition related to water quantity/quality); 130-131 (Alt 1 effects); 132-133 (consequences related to water quantity/quality); 364 (project consistency summary); 501-502 (responses to DEIS comments).

As documented in the FEIS, large woody material is generally lacking in project area streams, with a wide range of values that reflect the range of ecological variation within the project area. Several streams meet INFISH standards but not reference conditions (FEIS at 142). The project area is mostly devoid of live medium to large size trees most likely to be naturally recruited into stream channels (FEIS at 143). The

project would have adverse effects that are mostly localized and of short duration to aquatic resources, resulting in an insignificant magnitude of effects to aquatic habitat and aquatic biota at the subwatershed and subpopulation scale (FEIS at 144). Large wood recruitment potential may be reduced within RHCAs up to two decades as development of residual trees is promoted by reduced competition, with proposed wood placement offsetting this reduced potential, and in the long-term would increase the likelihood of a supply of large trees to streams (FEIS at 144). Large Woody Material is addressed in the FEIS at 141-145 (existing and consequences); 397 (stream restoration); 449-461 (RHCA prescriptions; designed to add LWM).

As for compliance with INFISH, the FEIS documents that not all streams are meeting Riparian Management Objectives, but objectives are meant to be achieved over time (INFISH Appendix E-3), and INFISH does not preclude land management activities in a watershed or RHCA where streams are not meeting RMOs (FEIS at 504, response to Comment 72). Riparian Habitat Conservation Areas and INFISH are addressed in the FEIS at 54-57 (RHCA conditions and effects in Forested Vegetation); 145-150, 153 (RHCA vegetation ecology conditions and effects, including cumulative, in Aquatic Biota); 377-379 (consistency with Forest Plan and INFISH); 429-435 (Aquatics Best Management Practices and Resource Protection Measures); 449-461 (RHCA Prescriptions); 504-506 (RHCA-specific responses to DEIS comments). Stream channel habitat features are described in the Hydrology and Aquatic Biota sections (FEIS at 93-157). FEIS Appendix C (FEIS at 429-442) is a complete list of Best Management Practices (BMP) and Resource Protection Measures (RPM) designed to protect and reduce effects to RHCAs, and FEIS Appendix E (FEIS at 449-461) details unit specific prescriptions designed to protect and reduce effects to RHCAs.

Objector Statement #48b: Objector states that the FEIS omitted citations of the data from the Summit Trail System Project DEIS and FEIS documents, noting that the data from this project is still valid, since it was collected on riparian areas for the Black Mountain area subwatersheds that overlapped that project. COLW at 4. Objector believes this constitutes a violation of NEPA through failure to prepare a transparent, accurate scientific analysis that uses high quality information, as required by CEQ regulations. COLW at 4-5.

Response: See the response to Objector Statement #18b.

Objector Statement #49: Objector states that the District overlooked and failed to share critical data (including trend data) regarding habitat condition ratings (shade, temperature, sediment, turbidity, bank stability and width/depth ratio) by stream in preparing the FEIS, including the following: survey data for Porter Creek from 1992, 1993, 1994, 2007, 2010 and 2014; 1994 surveys for Allen Creek; and 1994 and 2003 survey data for Peterson Creek. COLW at 7-14.

Response: I find that the District did not overlook or fail to share critical data.

The regulation at 40 CFR 1502.24 mandates professional and scientific integrity for an EIS.

The data the Interdisciplinary Team used in preparing the FEIS was extensive. The FEIS states that "all available data (1991-2017) were used to depict baseline conditions in the project area" (FEIS at 120, 504). Data for the streams and years cited by the objector are partially included and the data used was sufficient to depict current conditions and trends. The District has clarified that while "all available data" was not used, they had determined the Level II and PIBO surveys were sufficient to depict existing conditions and addressed all the parameters needed to analyze this vegetation management project.

The stream data that includes stream temperature analysis can be found in the FEIS at 94; 112-117; 127-128; 130-131; 132-133; 364; 501-502. Sediment analysis is outlined in the FEIS at 94; 102-112; 129; 131-132; 133-134; 364; 382; 429; 431-435; 497-501. Stream temperature data for the project area was

extensive and a full analysis of the direct and indirect effects of shade, the relationship of temperature to groundwater, topography and surface area is presented in the FEIS at 112. Stream survey data for the project area is summarized in the Aquatic Biota section, Table 40 (FEIS at 135) and Table 43 (FEIS at 142). See also the responses to Objector Statements #47 and #48a for responses on other stream parameters.

Objector Statement #50: Objector disagrees with the District's assertion that the 80% shade standard is likely unattainable, noting that similar streams on the forest that experience less management activity meet the standard, including Brush Creek (in roadless areas), Rock Creek and Cottonwood Creek, also noting that Porter Creek below the "swimming hole" typically exceeds the INFISH requirement, as it is in a steep canyon and blocks access to livestock grazing. COLW at 10-14.

Response: I find that the District considered the 80% shade standard in the Ochoco Forest Management Plan.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

The Ochoco National Forest Management Plan at 4-240 states that "requirements for shade along streams will generally correspond to provisions for more than 80 percent of the surface shaded. Where this cannot be attained, 100 percent of the potential for shade is the standard. Shade requirements may be reduced in cases where management is necessary to sustain a thrifty community of shade providing species over time, e.g., in the case of local infestation or disease, or for managing for future shade in a decadent stand, but activities may not result in an increase in temperatures above limits specified."

The FEIS at 112 reiterates this standard and guideline by stating "The Forest Plan requires that more than 80 percent of the stream surface be shaded. Where more than 80 percent of the stream surface shaded cannot be attained, maintaining 100 percent of the potential shade is the standard." The FEIS at 112 also states that "...stream surveys conducted over the last 25 years...indicates 80 percent is most likely an unattainable provision for this project area in the existing condition."

The FEIS at 114-117 describes the effects of the two action alternatives (2 and 3) to stream temperature. This includes possible vegetation changes and prescribed burning within riparian areas that could reduce shading in the near term. However, the FEIS at 117 "beneficial indirect affects to stream temperature are anticipated in the long term."

The response to comments notes that "No significant amount of shade removal would occur in the Black Mountain Project. Activities resulting in the reduction of vegetation within the Potential Shade Zone (PSZ) would be spatially intermittent and would not be expected to measurably decrease effective shade or increase water temperatures. Long-term, it is anticipated that shade would increase over the next 5-10 years due to increased vigor of residual riparian trees, shrubs, and grasses once some of the conifer canopy and understory is removed and/or consumed via implementation activities (noncommercial thinning and prescribed burning within RHCAs). Increased shade from the hardwoods would lead to incrementally lower temperatures in streams long-term (>5-10 years) which is a critical element fish need for safe survival during low flow periods when water temperatures increase in the summer months. A minor localized amount of shade would be reduced short-term (<5 years), but no measurable increase in water temperatures resulting from these activities is anticipated (FEIS 113-117)." FEIS at 501.

The response continues, stating that "The Black Mountain project interdisciplinary team carefully evaluated each stream and site-specific prescriptions were developed based on slope, aspect, stream condition, soil

conditions, existing vegetation, large woody material, and PSZ. For class I, II and III streams, efforts were made to ensure that activities did not occur or activities were minimal within the PSZ of live water reaches. Please refer to Appendix E for unit specific prescriptions." FEIS at 501.

Objector Statement #51: Objector states that the District's assertion that young conifers in riparian areas are causing stream degradation is not supported by science, stating that conifers in riparian areas are a consequence of stream degradation, not a cause, and removing them would increase livestock access to streams. COLW at 13, 27-30.

Response: I find that the District did not assert that young conifers in riparian areas are the only cause of stream degradation.

Degradation in streams and aquatic habitat is attributed to multiple factors, including past beaver trapping, stream channel berming, diversions, fire suppression, road building, past harvest practices, and legacy livestock grazing, all of which have contributed to current forest stand composition and densities near streambanks. FEIS at 102, 123, 124, 127, 146, and 258.

The Black Mountain Project stream buffers have dense stands outside of HRV, which currently out-compete the understory for basic resources like water, light, and nutrients and reduce the sediment buffer effectiveness. The District correctly explained existing dense and overstocked stand conditions can limit the amount of herbaceous understory (Anderson 2009) and the effectiveness of natural stream buffers for the existing condition in the FEIS at 104.

Objector Statement #52: Objector questions why sediment additions were only estimated for 10 percent of commercial timber harvest areas, instead of 20 percent, which is in line with information in the FEIS and also states that the sediment analysis did not include estimates of disturbance caused by thinning and prescribed burns. COLW at 9.

Response: I find that the District properly estimated sediment additions.

The Forest Plan and R6 Soils Supplement have standards and guidelines for 20% total detrimental soil condition (DSC) in a unit. DSC is analyzed in the Soils section of the FEIS at 79-93. The 10% referenced by the objector is what is written on page 106 of the FEIS. I asked my staff to clarify the 10% figure and found that this number is referring only to skid trails. When using the sediment delivery WEPP model for Black Mountain, my staff assumed that main skid trails would be on 10% of the unit because, typically, the timber sale crew lay's out units with main skid trails on 10% of the unit and monitoring data (project record and listed below) shows that on average, for this landscape and soil types, main skid trails are on 10% of a unit.

Non-commercial thinning and prescribed burning do not create enough ground disturbance to contribute measurable sediment delivery. Prescribed burning and thinning effects on soil are addressed in in the FEIS at 79-93 and details on prescriptions and design criteria are documented in the FEIS Appendix C and Appendix E. After review of public comments, that sediment yield was reanalyzed and was been edited for clarity and accuracy. FEIS 102-112.

Objector Statement #53: Objector states that the District was not transparent with the use of the WEPP model and there was no attempt to be transparent with model parameters, assumptions and inputs, rendering the conclusions unsupportable by best available scientific data and analyses. COLW at 10.

Response: I find that the District made available the WEPP model and the associated assumptions used for their analysis.

The regulation at 40 CFR 1502.24 mandates professional and scientific integrity for an EIS.

In Table 138, the response to DEIS Comment 52 (FEIS at 498) states that a description of the model (Water Erosion Prediction Project) and the associated assumptions used for the Black Mountain analysis are in the project record and available upon request. Boundaries for the model are described in the Hydrology Methodology section (FEIS at 94).

Objector Statement #54: Objector states that the preferred alternative does not meet the applicable Land and Resource Management Plan (LRMP) goals, standards and guidelines related to water quality and quantity, nor does it comply with INFISH Riparian Management Objectives because the District did not include measures to reduce or stop activities contributing toward riparian and stream degradation, and did not balance vegetation management impacts, high road densities and grazing impacts with restoration. COLW at 4-7 and 10-14. BMBP at 9.

Response: I find that the responsible official made every effort to develop and choose an alternative that best responds to the Ochoco National Forest LRMP goals LRMP 4-35, standards and guidelines related to water quality and quantity, through compliance with state requirements in accordance with the Clean Water Act.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action. Silvicultural practices may be applied in RHCAs to acquire desired vegetation characteristics where needed to attain RMOs and in a manner that does not retard attainment of RMOs and avoids adverse effects on inland native fish (INFISH at E-7).

The Black Mountain project interdisciplinary team carefully evaluated each RHCA and site-specific prescriptions were developed for each RHCA based on slope, aspect, stream condition, soil conditions, existing vegetation, large woody material, and potential shade zone (PDZ). These include no treatment buffers of various widths adjacent to stream channels, equipment restrictions, felling trees in/towards streams for large woody debris, diameter limits, and modifications to silvicultural prescriptions. FEIS at 55, 377, and 449. Site-specific prescriptions (FEIS at 449-461) were designed to accelerate the development of large trees for future down wood recruitment; retain and increase the abundance of existing old and/or large trees; reduce risk of high severity wildfire and loss of large trees to insects and disease; and increase the abundance and vigor of hardwoods for future down wood recruitment. FEIS at 55, 377, and 449. Prescriptions also include the felling and leaving of trees to provide large wood in the RHCAs. FEIS at 377 and 449-461.

Riparian Habitat Conservation Areas and INFISH are addressed in the FEIS at 54-57 (RHCA conditions and effects in Forested Vegetation); 145-150, 153 (RHCA vegetation ecology conditions and effects, including cumulative, in Aquatic Biota); 377-379 (consistency with Forest Plan and INFISH); 429-435 (Aquatics Best Management Practices and Resource Protection Measures); 449-461 (RHCA Prescriptions); 504-506 (RHCA-specific responses to DEIS comments). Stream channel habitat features are described in the Hydrology and Aquatic Biota sections (FEIS at 93-157). Appendix C (FEIS at 429-442) is a complete list of Best Management Practices (BMP) and Resource Protection Measures (RPM) designed to protect and reduce effects to RHCAs, and Appendix E (FEIS at 449-461) details unit specific prescriptions designed to protect and reduce effects to RHCAs.

I find that the District's analysis for this project did balance vegetation management impacts, road densities and grazing impacts with restoration. The District incorporated maintenance, closing and decommissioning of roads to meet restoration needs and to improve stream conditions while continuing to maintain safe and efficient travel. See the extensive Transportation analysis and planning for this project. FEIS at 274-283.

Objector Statement #55: Objector states that the District has not justified how the preferred alternative, which contains 50 miles of temporary roads, preserves high road densities, allows access on nearly one-half of the project area and maintains intensive livestock grazing, will achieve goals for historic range of variability, desired future conditions and restoration of riparian areas and wetlands. COLW at 6-7.

Response: I find the Responsible Official reviewed the best available science, applicable laws and regulations, public comments and the supporting analysis of the environmental effects and then made a sound decision in selecting Alternative 2 as the environmentally preferable alternative. Draft ROD at 11.

The regulation at 40 CFR 1505.2 documents the required contents of a record of decision.

In terms of context and intensity, the project includes up to 25 miles of temporary roads, closes or decommissions approximately 20 miles of roads, proposes prescribed burning of both activity-generated and naturally generated fuels across approximately 15,200 acres and proposes thinning across 6,585 acres. In total, management would occur on approximately 15,810 acres, which is about 46% of the project area. An EIS was prepared to document how implementation of the project moved the area toward desired conditions. The Responsible Official's rationale for her decision is fully documented in the draft Record of Decision. Draft ROD at 3-5.

Objector Statement #56: Objector states that the District failed to adequately acknowledge short-term impacts and arbitrarily asserted long-term benefits will offset any short-term impacts almost immediately (within 3 years), without conducting a full and fair assessment of the effectiveness of the project's mitigation measures related to water quality/quantity and INFISH goals. COLW at 7, 29 and 30.

Response: I find that the District adequately documented the presence of short-term impacts and long-term benefits related to water quality/quantity and INFISH goals.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

The FEIS discloses short-term impacts and long-term benefits related to water quality on pages 106-110 and 129-134.

Objector Statement #57: Objector states that the District overlooked critical data regarding habitat condition ratings (shade, sediment, turbidity, bank stability and width/depth ratio) by stream in preparing the FEIS, including the following: survey data for Porter Creek from 1992, 1993, 1994, 2007, 2010 and 2014; 1994 surveys for Allen Creek; and 1994 and 2003 survey data for Peterson Creek. COLW at 7-10.

Response: See response to Objector Statement #49.

Objector Statement #58: Objector notes that streams in the project area fail to meet INFISH standards for large wood, and requests that trees collected for instream restoration be collected from outside of RHCAs to avoid impacts to the riparian areas. COLW at 14-15.

Response: I find that the Forest carefully evaluated each Riparian Habitat Conservation Areas and developed prescriptions for each based on slope, aspect, stream condition, soil conditions, and existing vegetation.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

The Black Mountain project interdisciplinary team carefully evaluated each Riparian Habitat Conservation Area (RHCA) and site specific prescriptions were developed for each RHCA based on slope, aspect, stream condition, soil conditions, existing vegetation, large woody material, and potential shade zone (PDZ). These include no treatment buffers of various widths adjacent to stream channels, equipment restrictions, felling trees in/towards streams for large woody debris, diameter limits, and modifications to silvicultural prescriptions. FEIS at 54-56 and 449. Best Management Practices (BMP) and Resource Protection Measures (RPM) are also included in project design and RHCA prescriptions to protect these areas and comply with INFISH. FEIS 429- 442 and 449-462.

As part of the objection resolution process, the Responsible Official clarified that large wood source units are not a continuous treatment; rather, there would be approximately one or two trees (mid-canopy fir <21" dbh) cut for instream placement every hundred yards or so. The Responsible Official clarified that spatial arrangement is important and retention of cover is assessed. This clarification will be included in the final decision.

Objector Statement #59: Objector states that the District failed to "adequately analyze impacts on riparian areas resulting from high road densities, treatment projects (commercial, thinning and prescribed burning), and livestock grazing in violation of the National Environmental Policy Act and the National Forest Management Act." COLW at 20-37.

Response: I find that the Forest adequately analyzed impacts on riparian areas and is not in violation of NEPA and the NFMA.

Please see the responses to Objector Statements #13, 46, 47, 48, 53, 54 and 57.

Objector Statement #60: Objector states that they believe the District's assertion that the goals of the proposed project to restore the historic range of variability of forested areas is an invalid and unsupported assertion for riparian areas, because restoration to historic conditions cannot occur without resolving the underlying causes of degradation (high road densities and livestock grazing). COLW at 22-23 and 29-33. Objector believes that the District failed to take a hard look at this issue and failed to demonstrate how the project complies with the Ochoco LRMP, as amended. COLW at 22-23 and 33.

Response: See the response to Objector Statement #55.

Objector Statement #61: Objector believes the amount of area slated for treatment will harm riparian areas and streams because disturbing almost one-third of the project area would further contribute to soil disturbance; opening stands by reducing density of conifers will allow access by livestock, further impacting stream and bank conditions; and the disturbance model used applied "only assumptions that analyzed

sediment from harvested units and roads" and failed to account for sediment from thinning and burning, and believes that omitting this best available data is a "failure to prepare a transparent, objective, "accurate scientific analysis" using "high quality information" that the District developed. COLW at 26-30.

Response: I find that the Responsible Official did consider all impacts to riparian areas and streams; including proposed activities (harvested units, roads, thinning and burning) and other cumulative effects including livestock use.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

The FEIS at 102 to 112 analyzes the existing condition and effects of alternatives to sediment within the effected watersheds. The FEIS at 110-112 analyzes cumulative effects to sediment. The FEIS at 111 specifically talks about cumulative effects in regard to grazing. The FEIS at 111 says "Fox Canyon Cluster AMP FEIS, Big Summit Cluster AMP FEIS, and Badger AMP contain livestock grazing PDFs developed to improve grazing conditions long-term, when in combination with Black Mountain vegetation activities have the potential to neutralize negative cumulative effects."

Please see the responses to Objector Statements #13, 46, 47, 48, 53, 54 and 57.

Objector Statement #62: Objector states that meaningful restoration of streams is predicated on uncertain funding for fencing or "natural barriers" which raises the uncertainly in their effectiveness, and believes the District needs to commit to funding, constructing, monitoring and maintaining fences proposed for this project and must add more fencing along streams (in particular Peterson and Porter Creeks and their tributaries) to further limit livestock grazing in riparian areas. COLW at 31-33.

Response: I find that the FEIS addressed grazing impacts.

The regulation at 40 CFR 1502.16 requires an EIS to include the environmental impacts of the alternatives, including the proposed action.

The FEIS at 398 states that "During stream restoration activities, woody debris and other native woody materials would be strategically placed to protect the activities and/or associated plantings. This may include large woody debris placed by machinery and/or hand placement of small trees or branches to protect channels or riparian plants. If restoration activities on the upstream reach of East Porter Creek within the Badger allotment cannot be protected with woody debris and native materials, a fence would be constructed for their protection depending on availability of funding." Therefore, depending on the outcome of these restoration activities the proposed fences may or may not be needed.

Final Remedies/Resolution for Aquatic Resources: The FEIS documented potential impacts to aquatic resources. As documented in the response to Objector Statement #58, as part of the objection resolution process, the Responsible Official clarified that large wood source units are not a continuous treatment; rather, there would be approximately one or two trees (mid-canopy fir <21" dbh) cut for instream placement every hundred yards or so. The Responsible Official clarified that spatial arrangement is important and retention of cover is assessed. This clarification will be included in the final decision. No other remedy or resolution is needed.

Best available science/scientific controversy

Overview and Objector's Suggested Remedies: These objection issues surround the objector's concerns that the best available science is not presented in its full range. Suggested remedies include "incorporate the requisite best available science and use the science accurately, with professional integrity in analysis in a new SEIS available for public comment for the Black Mountain project, to better and more accurately inform public comments, agency review, and decision-making."

Objector Statement #63: Objector states that the FEIS failed to use the full range of best available science and that the statement "the science is always changing" is not a reason to not analyze the full range of best available science. BMBP at 7.

Response: I find that the Responsible Official used the best available science.

The regulation at 40 CFR 1502.24 mandates professional and scientific integrity for an EIS.

The FEIS at 33 outlines the role of science in terms of preparation of the FEIS. The FEIS at 531-549 documents the hundreds of publications cited throughout the document. The FEIS at 509 documents consideration of science submitted by the objector and agrees that biological potential has been replaced by DecAID for consideration of the best science.

Objector Statement #64: Objector states that the FEIS fails to disclose scientific controversy over the efficacy and ecological soundness of managing to reduce the severity of wildfire. BMBP at 8.

Response: I find that the Responsible Official adequately considered and disclosed best available science and addressed incomplete or unavailable information in the FEIS.

The regulation at 40 CFR 1502.24 mandates professional and scientific integrity for an EIS.

Objector believes that the Hagmann et al. study is scientifically controversial. The FEIS at 42 utilizes information from the Hagmann et al, 2013 document in the discussion of the historical conditions of the area. In addition, the FEIS further notes additional studies and discloses the discrepancies found in the literature. Specifically, the FEIS states that "In Hagmann et al. (2013) and Merschel, Spies and Heyerdahl (2014) researchers used historical survey data and forest reconstruction plot data (respectively) to reconstruct historic forest conditions in the East Cascades (Hagmann et al. 2013) and East Cascades and Ochoco (Merschel, Spies and Heyerdahl 2014). Both studies utilized intensively sampled datasets and found large discrepancies between historic forest composition and structure data (both survey and reconstructed) and the conclusions and landscape extrapolations made by other studies (Baker 2012) across some of the same forested regions in Central Oregon. Churchill et al. (2017) documents increases in current tree density, proportional decreases in ponderosa pine abundance, and decreases in mean tree diameters as compared to historic stand conditions. Collectively this work supports and is supported by the majority of other forest reconstruction work across the inland West, documenting the widespread increase f young shade tolerant species (principally white fir/grand fir and Douglas-fir) following euro-American settlement, grazing, the suppression of fire, and the harvest of large fire-tolerant species. Hagmann concludes, "The historical inventory of Reservation lands provides strong evidence that forests on mixed-conifer sites were predominantly low-density, pine-dominated, and have undergone massive changes in composition and density (Hagmann et al. 2013)." FEIS at 42.

The FEIS at 64-77 analyzes the effects of the alternatives through modelling and cited literature to demonstrate how the proposed fuel treatments would affect ground, ladder and crown fuels. This section discloses a wide array of effects to not only demonstrate how the proposed actions move the stands towards more historic conditions, but also the risks of the actions by disclosing the fine fuel increase, increased wind speeds, and facilitated spread of surface fire.

The FEIS at 494, response to comments, addressed the objector's concerns regarding the use of HRV by responding "The commenter did not identify or provide references for the recent science referenced in the comment. The ONF is not aware of any recent science refuting the use of Historic Range of Variability (HRV) and review of the Pacific Northwest Research Station website did not identify any recent publications refuting the use of HRV, therefore we are unable to disclose, analyze and address recent science as requested by the commenter. A discussion about climate change is included in the FEIS. Discussion of changes to forest management policy and direction is outside the scope of this project."

Final Remedies/Resolution for Best available science/scientific controversy: The FEIS documented the use of best science and considered science that found different conclusions. The FEIS articulated the rationale behind the findings and conclusions and provided ample literature to support the conclusions. No remedy or resolution is needed.

Clean Water Act

Overview and Objector's Suggested Remedies: This objection issue surrounds the objector's concerns that there are potential violations of the Clean Water Act with regard to stream temperature standards, bank stability, large wood recruitment over time, and sediment, and/or by further exacerbating water quality criteria impacts for which 303(d) streams were listed, or by violating subsequent TMDLs and Water Quality plans. Suggested remedies include dropping all logging and road building or reopening in RHCAs.

Objector Statement #65: Objector states that the FEIS failed to comply with the Clean Water Act. BMBP at 22.

Response: I find the Responsible Official complied with the Clean Water Act and disclosed how the project would be consistent with the 303(d) listed stream segments in the project area in the FEIS. Also, upon review, it is noted that there is currently no Total Maximum Daily Load (TMDL) or associated water quality plan for these watersheds related to the proposed project area of effects analyses. Therefore, the Black Mountain Project is consistent with the Clean Water Act.

The regulation at 33 U.S.C. 1313 (Clean Water Act) Section 303(d) states that water bodies that violate water quality standards, thereby failing to fully protect beneficial uses, be identified. Total Maximum Daily Loads (TMDLs) must then be completed for the 303(d) listed waterbodies. TMDLs identify loading capacities that are set to limit pollutant levels such that water quality standards are met.

The FEIS at 112 states that "Allen Creek, Porter Creek, Peterson Creek and North Fork Crooked River are on the Oregon Department of Environmental Quality (ODEQ) 303(d) list due to elevated summer water temperature." The FEIS analyzes the project area for stream temperature, both the existing condition and the alternatives within the FEIS at 112-117. The FEIS summarizes the effects to stream temperatures at 118 stating that "Alternative 2 commercial harvest units would have no adverse effects to stream temperature." The FEIS continues, stating that for Alternative 2 and 3 short-term (<5years), noncommercial hardwood enhancements may reduce shade in a very minor amount, on a localized scale, and are not expected to result in a measurable increase in water temperatures, especially considering the scope of

activities in relation to the size of the watershed." Finally, the FEIS concludes that "for Alternative 2 and 3 beneficial indirect effects to shade and stream temperature are anticipated in the long term (>5-10 years) from the general improvement in the condition of RHCAs due to increased stream stability and hydrologic function." FEIS at 118.

Final Remedies/Resolution for Clean Water Act: The FEIS documented how the project complied with the Clean Water Act. No remedy or resolution is needed.

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Attachment C

Relevant Expert Reports

Surveys for Closed and Decommissioned Roads in the Ochoco National Forest Black Mountain Vegetation Management Project Area: What Did We Learn?

Amy Stuart, Joanne Richter, Mary Fleishmann, Rynda Clark, Jamie Dawson, Julie Weikel, Mathieu Federspiel and Laurie Eimans

Great Old Broads for Wilderness; Central Oregon Bitterbrush Broadband

Abstract

The Great Old Broads for Wilderness (Broads) are concerned about the high density of roads on the Ochoco National Forest (Forest) particularly roads that are designated as "closed" roads (Maintenance Level 1 (ML-1)) which are roads held in storage for future use, and "decommissioned" roads, that have been removed from the Forest Service system. Both types of roads sometimes receive unauthorized vehicular use by the public. The Broads conducted road surveys in the Black Mountain Vegetation Management Project (Project) area, a 34,013-acre area that will receive extensive vegetation treatments along with new construction and re-construction of temporary and Forest system roads. Roads that are depicted and evaluated as closed or decommissioned on a map but are functionally open, cause the same impacts to fish and wildlife species and their habitats as open roads. Many of the closed and some of the decommissioned roads on the Forest are not physically blocked and the public has no way of knowing the roads are closed unless they use a Motor Vehicle Use Map (MVUM) to determine whether the road is open for public use or not. We surveyed 115 ML-1 closed, decommissioned and user-created roads in the Project area in July and September 2020 to determine their status of use. Of the 115 roads we found, 63 roads were closed, decommissioned, or user-created and were receiving unauthorized vehicular use, 45 roads were closed and/or decommissioned primarily due to vegetation growth of which 7 had physical barriers or were "ripped" to deter use, and 7 decommissioned roads were not surveyed. We documented that 63% of the ML-1 closed roads (45 of 71 ML-1 roads surveyed), 33% of the decommissioned roads (13 of 39), and at least 5 user created-roads were documented in the Project area that had unauthorized vehicular use. The latter appeared to be user-created roads that were not on any map and were driven by the public, and in some cases, were part of a much larger network.

Introduction

The Forest has a high density of roads across the landscape except in designated Wilderness Areas and some special Management Areas. Most of the extensive road system has been in existence for more than 40-50 years and were generally constructed for access to timber harvest areas (Black Mountain Final Environmental Impact Statement (FEIS) p. 275).

The Forest Service designates areas of the forest by a management area (MA). Most of the Black Mountain Project area is in MA-F22 (General Forest) while there are smaller MAs identified as the North Fork Crooked River Recreation Corridor, Visual Corridor (along the 22 and 3010 roads), Summit Trail Retention (along the historic Summit Trail), Summit Trail Preservation, Old Growth, and Developed Recreation (Allen Creek Horse Camp). Management Area designation determines the type and amount of vegetation management treatments and legally open road densities for each MA.

The Forest Service under the 2005 Travel Management Rule implemented a new road closure system in 2011 on the Ochoco Forest. Prior to that all roads were open unless designated closed and Forest users had motorized access to anywhere on the forest that they could drive as long as they did not cause resource damage such as wildlife disturbance, damage to meadows and scablands, and the spread of weeds. Under the 2011 Travel Management Plan (TMP), Forest users are only allowed to use open roads that are designated on the MVUM maps. In addition, under the Forest Land and Resource Management Plan (LRMP) (USDA 1989), the Forest has a standard of a maximum of 3 miles of open road density per square mile in General Forest MA (LRMP 4-259). This standard is used by forest personnel to determine whether a proposed project area complies with or violates the forest road density standard.

Forest Service roads are assigned a Maintenance Level (ML) of 1-5 depending on the service level provided and maintenance required for the road (Black Mountain FEIS p. 276). Open roads are defined as all roads that the public legally can drive and are designated ML 2-5 roads. ML 2-5 roads are open to motorized traffic and receive varying levels of maintenance depending on the service provided (FSH 7709.59). The Forest Service states that "Operational Maintenance Levels define the degree of maintenance required for a specific road and the level of service which that road provides, consistent with road management objectives and maintenance criteria (Forest Service Handbook (FSH) 7709.58, Transportation System Maintenance Handbook)." ML 1 roads are considered "closed" which means they are suitable for nonmotorized uses such as pedestrians and equestrians but closed to motorized traffic and receive minimal custodial maintenance (Black Mountain FEIS p. 512). Appropriate traffic management strategies on ML 1 roads are "prohibit" and "eliminate" all traffic (FSH 7709.59_63.32). It is prohibited to possess or operate a motor vehicle on ML 1 roads (36 CFR 261.15). Only open roads, and not closed and decommissioned roads are shown on MVUM maps.

The Black Mountain FEIS reported a pre-project open road density of 2.66 miles per square mile (mi/mi^2) (Black Mountain FEIS p. 209). Forest specialists calculated the open road density only using ML 2-5 designated roads and assume all ML 1 "closed" roads in the project area are not driven, and that there are no additional (i.e., undesignated, temporary hauling roads, user-created routes) roads in the Project area.

The following three paragraphs enumerate Forest and project specific open road densities as compared to the Project calculated open road densities.

The 2003 Ochoco Forest Roads (Roads) Analysis stated in Chapter 2 that "In most areas [on the forest] existing open road densities are higher than the identified objectives. The Trail System and Off-Highway Vehicle Management and Development EIS completed by the Forest in 1996 found open road densities ranged from 0 to > 12 mi/mi^2. Average road densities in General Forest and Winter Range designations were 4.01 mi/mi^2 and 3.14 mi/mi^2 respectively" (USDA 2003). The 2003 Roads analysis also reported that many roads were constructed in close proximity to or across streams, contributing to sediment instream, and that the current road system has increased the hydrologic network causing water to flow more quickly from most 5th field watersheds.

The Summit Trail Supplemental Final Environmental Impact Statement (Summit Trail SFEIS) which encompassed the Black Mountain Project area, analyzed the miles of existing roads and proposed trail miles within 300 feet of streams (Summit Trail SFEIS Table 116, p. 221). The Summit Trail SFEIS reported that the Peterson Creek subwatershed (that includes Peterson Creek, Allen Creek and tributaries) had an open (legally) road density of 3.7 mi/mi^2 within 300 feet of streams while the total road density including closed roads was 4.7 mi/mi^2. For the Porter Creek subwatershed road densities within 300 feet of streams were even higher at 4.4 mi/mi^{i2} for legally open roads and 6.5 mi/mi^2 for total road mile density. Within the entire watershed but particularly within the designated 300 feet of Riparian Habitat Conservation Areas, the areas in the Summit Trail Project area failed to meet the LRMP road standards for open road densities of no greater than 3 mi/mi^2 in General Forest.

The Black Mountain FEIS disclosed that the open road density in the project area is 2.66 mi/mi^2 (Black Mountain FEIS Table 63, p. 209), which is substantially less than reported in the Summit Trail SFEIS. Unlike the Summit Trail SFEIS which informed the public of combined open and closed road densities, the Black Mountain FEIS did not disclose this information. The FEIS stated that the entire project area is 34, 013 acres (FEIS p. 161) and "There are approximately 193 miles of roads within the project area (141.2 miles open, 51.5 miles closed) (FEIS p. 78). Therefore, the most conservative estimate of road densities in the project area is 3.63 mi/mi^2 including open and closed roads (ML 1-5). This estimate does not include decommissioned roads that are driven by the public, temporary roads or user-created roads, underestimating the real impact to natural resources.

The high density of open, closed, decommissioned and user-created roads that are driven by motor vehicles on the Forest impact aquatic and wildlife species and their habitats in a variety of ways. Essentially closed, decommissioned and user-created roads that are driven have the same impact as an open road. For wildlife species, impacts from open roads and closed roads that are driven include loss of habitat, habitat fragmentation and reduced connectivity, direct and indirect mortality, increased stress and impaired reproduction, and alteration of habitats by increased invasive plant and animal species. For streams and aquatic species, forest roads and associated activities (such as logging roads or off highway vehicle trails) increase the hydrologic network connecting uplands with streams, alter peak flows and contribute to increases in sediment and turbidity. Riparian areas, streams and wetlands generally occupy a small percentage of the landscape but are sensitive and more vulnerable to destruction, and their impairment is critical because of their scarcity and importance to riparian dependent aquatic and terrestrial species. Similarly, wetlands serve essential functions, such as improving water quality by filtering sediments, nutrients, and contaminants from the water column (US Environmental Protection Agency 2002). Wetlands also provide essential habitat for a wide variety of plants and animals including many federally threatened, endangered species, as well as sensitive species. For example, the Columbia spotted frog and redband trout are aquatic federal species of concern in the Black Mountain project area. Riparian areas and wetlands are a small percentage of forest lands but are generally more productive in plant and animal biomass and higher in species biodiversity than surrounding areas. When the Forest underestimates the road density in a project area by only including legally open roads, and discounts vehicle use of unauthorized roads, the Forest

underestimates the impact to other forest resources including fish and wildlife species and their habitats, riparian areas and wetlands, and water quantity and quality in streams.

Methods

The Black Mountain Project is generally located on the east side of Big Summit Prairie of the Ochoco National Forest (Figure 1). The purpose of the 34,013-acre Project is to "restore characteristic (i.e., dry forest vegetative) conditions in the Project area, thereby increasing resilience to insects, disease, fire, and drought, reducing the risk of uncharacteristic high severity fires" (Black Mountain FEIS p. 10). The Project will implement commercial harvest, noncommercial thinning, prescribed burning, hardwood enhancement, new road construction, temporary road construction, reopen "closed" roads, and close and decommission roads on 15,810 acres of the Project area.

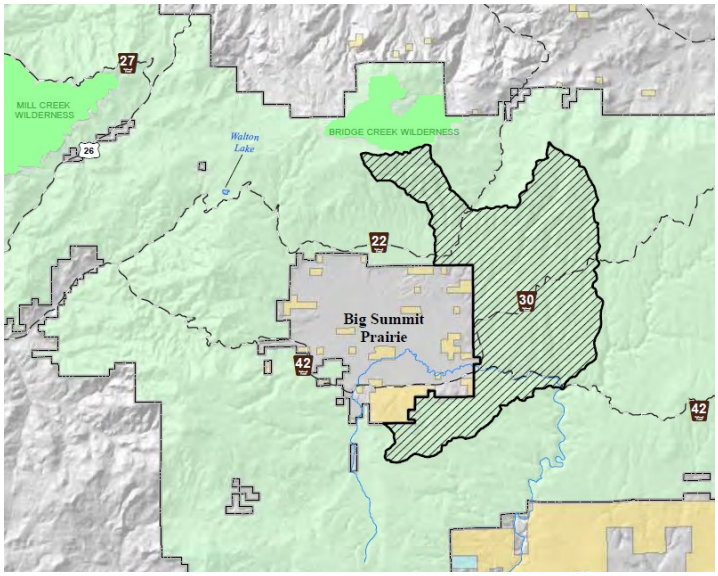

Figure 1. Black Mountain Vegetation Management Project vicinity. The project is located approximately 40 miles east of the City of Prineville, Oregon (Source: Black Mountain FEIS Map 1).

The Black Mountain FEIS provided maps of open and closed roads (Figure 2), with Maps 11 and 12 delineating "closed" roads in the thin red lines while "open" roads are black lines. However, the maps in the FEIS did not show some of the decommissioned roads on the administrative maps for the Lookout Mountain and Paulina Ranger districts, newly discovered roads not represented on any maps, nor any temporary roads and unauthorized routes and user-created trails.

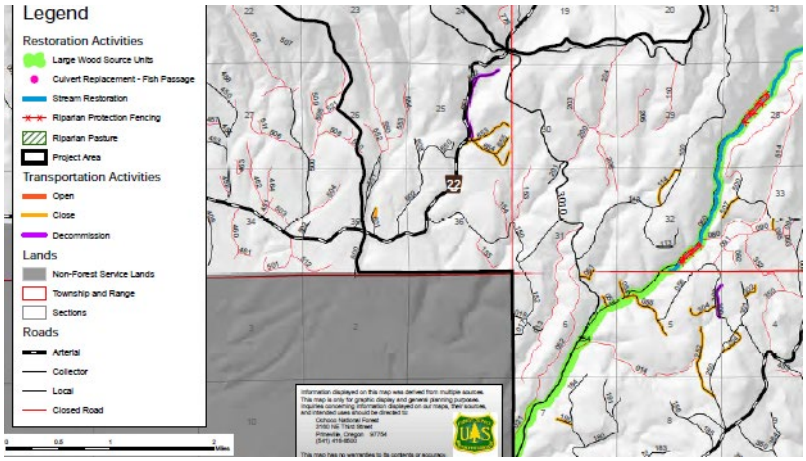

Figure 2. Portion of the Black Mountain Project area with open (black lines) and closed (thin red lines) roads (Source: Black Mountain FEIS, Maps 11 and 12). These maps did not to include roads on the administrative maps or other roads found on the ground.

Members of the Broads surveyed ML 1 closed and decommissioned roads in the Project area (Figure 1) during the summer and early fall of 2020 to assess how many of the closed or decommissioned roads in the area were physically closed or had a barrier, and if they had been driven that year. The surveys occurred for four days on July 14-15, September 1, and September 7. Open roads were determined using the Forest MVUM maps #2 and #3 for the Project area, while closed and decommissioned roads were determined using maps from the Black Mountain FEIS and the Ranger District Administrative Maps available for purchase on Avenza Maps, one of several mapping applications. The two administrative maps used for the Project area were the Prineville Ranger District Map (Lookout Mountain) (1983) and Paulina Ranger District Map (1998). Roads on the Ranger District maps and not on the MUVM maps are most of the closed or decommissioned roads in the Project area. However, because these maps are decades old, the Broads found several roads on Forest Service lands that were unmarked with any road system number, that were well driven, and not on either MVUM or Ranger District administrative maps. Surveyors documented numerous user-created roads not found on any maps.

The Project area was broken into 4 quadrants and each area assigned to teams of 1 to 2 people per team. Each quadrant encompassed one of 4 stream areas on the Forest including Allen Creek, Peterson Creek, Porter Creek and Hickey Meadow and their respective tributaries. Each team was given a map of their quadrant delineating open and closed/decommissioned roads, and a list of roads to survey. Each team documented their survey of closed and decommissioned roads determining if roads were open and being driven, open and driven with a breached barrier such as a log or berm, closed due to a barrier or closed due to vegetation growing in and obscuring the road, or not surveyed. The surveyors recorded their observations on a table with their list of roads to surveys and took photos of closed and decommissioned roads and a few of the user-created roads that were driven by the public.

On the list of roads to survey, many but not all closed and decommissioned roads have a number based on the Forest Service road system with arterial, collector and “spur” roads having either a 4-digit or 3-digit number. For example, the 22 (2200 road), 30 (3000 road) and 42 (4200 road) are main arterial

roads while several roads such as the 4230 and 3010 roads are connector roads. In addition, many roads have a 3-digit road number which can be either a connector road, or a spur road that ends in the forest or on a scabland. All legally open, closed, and decommissioned roads were identified on maps so that teams could travel to the roads and determine their status. Roads were determined to have been driven by evidence of recent vehicle wheel tracks and current year's vegetation that had been flattened by vehicles. Surveyors took photos of each of the closed or decommissioned roads that had been driven in 2020 to document their use and any barriers. In many cases, the surveyors hiked closed roads that had been driven to determine how far vehicles had traveled and if there were any barriers further on the roadway not visible from the open road. In a few cases, the lower ends of spur roads from a main road are designated open for a certain distance and then legally closed for the remainder, usually in the upper reaches in a watershed (e.g. the 30-500 road in the Peterson Creek watershed).

Results:

We surveyed 115 closed, decommissioned and user-created roads in the Black Mountain Vegetation Project Area in July and September 2020 (Table 1). Of the 115 roads, we did not survey 7 of the decommissioned roads. However, we found 63 closed, decommissioned or user-created roads that were open, most with no barrier, and extensively used by the public and 45 roads that were closed and not driven. Of the 45 closed or decommissioned roads that were unused by the public, only 7 had effective physical barriers (logs that had fallen or rocks that had been placed) or were ripped to block access while the remaining 38 roads were grown in with vegetation. Of the 63 closed, decommissioned and user-created roads that were open and driven, 11 (17%) had ineffective barriers such as small berms that had been breached and 52 (83%) had no barriers at all to discourage public use. We did not document all of the user-created roads that we found but noted locations of 5 well used user-created roads driven by the public.

Table 1. Survey results of closed and decommissioned roads in the Black Mountain project area to determine if they were open and driven by the public in 2020. 65% of closed roads and 33% of decommissioned roads were open and driven by the public.

	Closed Roads		Decommissioned Roads			User-Created	
Survey Results	Closed	Open but driven	Decommissioned	Decommissioned by driven	Not Surveyed	Open	Total
Number of Roads	26	45	19	13	7	5	115
% driven by the public	63%		33%			100%	

Only one closed road had a sign to discourage use and had been well driven indicating a disregard for signage. The sign which was labeled "No Motorized Vehicles – to provide habitat security for elk" had

been broken and dropped next to a livestock barb wire gate. Many of the closed roads with barriers that had been breached had all-terrain vehicles (ATV) and ultra-terrain vehicles (UTV) tracks. The advent of these types of vehicles has allowed forest users to successfully travel around or go over what few barriers had been installed that were intended to eliminate motorized use.

These results are similar to a survey done by the Oregon Department of Fish and Wildlife (ODFW) in 2016 in the 301,000-acre area of the Summit Trail System, a proposed 137 mile Off Highway Vehicle trail system that included the Black Mountain Project area. ODFW conducted a motorized vehicle survey on randomly sampled closed roads per the 2015 MVUM maps for 3 weeks from mid-May to early June 2016. By June 3, 2016, the last day of the survey, 60% of the closed roads had received motorized vehicle use (Jackle 2016).

During the course of the Black Mountain Project road survey, we found several user-created roads and ATV and UTV trails that were not on any map but were well used. Most were found in the Allen, Peterson, and Porter creek subwatersheds although a few were found in the Hickey Meadow area as well. The most user-created roads were found in the upper reaches of Peterson, Dry Porter and East Porter creeks, with a network of user-created roads and trails connecting to the 30-500 road and between ridges and creeks. Many user-created roads were not documented in this survey.

The Black Mountain FEIS states that "Many of the three digit roads receive very light use until the beginning of archery season, at which time road use increases. Off-highway vehicle (OHV) use within the project area has also increased in the last 10 years, which is primarily associated with the beginning of archery season and related in general to other hunting activities" (FEIS p. 208-209). Further in the document the FEIS asserts that "Public road use in the project area becomes more moderate in the spring after snow melt and continues to increase through the summer. The heaviest road use occurs in late summer and fall with the commencement of deer and elk hunting season" (Black Mountain FEIS p. 275). We disagree with the statement that many of the three digit roads receive very light use until the beginning of the archery season as we saw lots of public use of open, closed and decommissioned roads during our survey in July 2020.

The ODFW surveys occurred in May and June while the Broads surveys occurred in mid-July and early September. Big game hunting seasons commence with an archery season for both species in late August, a rifle buck season in late September and early October, and 2 rifle elk seasons in late October and early November. Both the ODFW and Broads surveys occurred prior to most of the big game hunting seasons. If recreation use of closed roads increases during hunting seasons, then both the number of closed roads and the amount of use of closed roads would increase beyond the approximate 60-63% noncompliance for closed roads found in the two studies. This amount of public use of closed roads and decommissioned roads from April after snow recedes to late November each year fails to protect fish and wildlife species and their habitats from the intended designation of road closures.

The following figures are examples of photos taken of closed, decommissioned and user-created roads that were surveyed in July and September 2020 and demonstrate the ineffectiveness of using simply MVUM maps or small berms that are easily breached, to manage road closures (Figures 3-11).

1. Hickey Meadow and tributaries

Figure 3. 4240-051 road, a closed road that has been driven. The second photo is a user-created road not on any map from the 4230-820 road. Well driven roads with no barriers or signs to indicate closed.

Figure 4. 4230-706 road west and east ends, respectively. Note sign with “No motorized use – to provide habitat security for elk” on a road that has been well driven. The sign was found on the ground.

2. Allen Creek and tributaries

Figure 5. Well driven 22-453 road with berm and illegal road created to go around berm and cross Allen Creek.

Figure 6. Well driven user-created road across from 22-602 road. No road number found or signs to indicate closed road. Road not found on any administrative or FEIS maps.

3. Porter Creek and tributaries

Figure 7. 42-420 road. Well driven closed road. Second picture shows a breached berm.

Figure 8. 30-502 and 30-506 roads. Well driven closed roads in the Port Spring area. No signs or barriers found.

4. Peterson Creek and tributaries

Figure 9. 3010-080 road. Entrance road from the 3010 road and then crosses Peterson Creek. Very small and ineffective berm found across the creek at the west end. Well driven from the 3010 road to the 30-500 road (east end). No sign or barrier was found.

Figure 10. East end of 3010-080 closed road and across from this road the 30-514 closed road, both well driven. No barriers found.

Figure 11. 30-500 road at its legal end. Breached berm in the left picture that is well driven and a go around road in the right picture. This breached road allows unauthorized motor vehicle access to another 2 miles of closed road in the headwaters of Peterson Creek and a network of roads and trails that extends to Dry Porter Creek.

Discussion

Historic ranges of variability (HRV) for the Forest were developed from the Viable Ecosystem Management Guide and other historic information sources such as USGS land survey notes from the 1870's, fire history records, and the 1907 Forest Establishment Report for the Forest (Black Mountain FEIS p. 10). Historically old forests had several major components that affected the distribution and density of tree species on the landscape. They generally include 1) plant association groups, which is the potential natural vegetation of a site based on climate, elevation, soil type, soil moisture and geology, 2) seral conditions or structure, and 3) frequency of and resilience to disturbance. Resource specialists believe that the patchy nature of dry site old growth forests in central and eastern Oregon included ponderosa pine and western larch in dry mixed conifer, along with a mix of moist mixed conifers in sites with a higher moisture regime such as at higher elevations or north facing slopes (Franklin et al. 2013). These HRV descriptions of tree stands are considered the most resilient to disturbance by some Forest Service personnel (insects, disease, and wildfire), that are supposed to provide conditions necessary for dependent and other wildlife species. However, restoration for forest health by managing for tree species, size and density does not address other aspects of ecological restoration that is much needed on the forest such as reducing and improving road systems, addressing pressures from livestock grazing, and restoring riparian habitats and instream conditions in streams and rivers.

The umbrella of Forest Health guided by HRV is used to pursue vegetation management projects with the purpose of increasing resilience from wildfires. However, the Forest fails to include and adequately analyze road densities that also need to be addressed to improve ecological conditions on the forest. The Project is largely designed to restore the vegetative forest health component but not the fish and wildlife habitats and streams, riparian areas and wetlands that are affected by the large number of roads on the landscape. While the Project includes proposed road closures and decommissioning of 17.16 and 2.97 miles, respectively, these actions are dependent on future mitigation funds or grants and not assured.

For the Black Mountain Project, Forest personnel only used roads designated as ML 2-5 or legally "open" in their analyses of road density and did not include ML 1 "closed" roads, decommissioned roads and other roads including undesignated roads, temporary hauling routes and user-created motorized trails in the Project area that are driven by the public. By using only ML 2-5 roads, the Forest alleges that it is compliant with the LRMP standard of less than 3 mi/mi^2. The 2005 Travel Management Planning process, when road status was changed and road density standards were set, was preceded more than 16 years by the LRMP that was completed in 1989, when virtually all roads were considered open on the landscape. However, changing the legal status of a road on the landscape does not resolve its impact to other resources when it is driven. It is well documented in the scientific literature that all roads, especially those actively driven, no matter their designated status, have detrimental effects on fish and wildlife, and their habitats.

The Broads' survey was conducted to determine the number of closed, decommissioned and user-created roads that were physically open and used on the landscape and did not evaluate road densities. However, it is clear from reviewing the FEIS documents and maps, and administrative maps, that only

roads that are considered legally open are evaluated for Forest Service management projects in terms of meeting road density standards. None of the closed roads, decommissioned or user-created roads that are driven by the public were used in the FEIS analyses to determine the true road densities and consequently the real impacts to fish and wildlife populations and their habitats.

***Impacts to Aquatics*:** Sediment is the greatest pollutant of forest streams, and in the absence of wildfire, forest road networks are the main annual sources of sediment in forest watersheds (Elliot et al. 2011). Numerous authors have reported the impacts of high road densities on streams and aquatic life. Overgrown and revegetated roads that are cleared and used for logging traffic increase erosion rates by 100-fold (Foltz et al. 2009). Years of compaction by vehicles effectively and permanently impacts runoff and sedimentation from lack of infiltration. Stream crossings along with roads are also a major source of sediment to streams (Furniss et al. 1991). There is no "safe" threshold road density for aquatic species because negative impacts begin with the first road segment in a watershed, and highly significant impacts begin at road densities as low as 1 mi/mi^2 (Carnefix and Frissell 2009).

Research has demonstrated increased sediment production by traffic. Roads with heavy traffic generate 4 to 5 times the sediment of roads compared to roads with light traffic (Elliot et al. 2010). One study documented that heavily used roads increase sediment production by 130 times greater than abandoned roads (Reid and Dunne 1984), while another study showed that roads with traffic deliver 2 to 30 times sediment production compared to unused roads (Luce and Black 2001).

Sediment in streams from roads causes filling of pools, enlarged channel widths and widening width-to-depth ratios (Jackson and Beschta 1984; Lisle 1982). As road density increases, pool frequency quantity and quality decline (Lee et al. 1997) which are in turn correlated with declines in native trout such as bull trout, Westslope cutthroat trout, Yellowstone cutthroat trout, and redband trout. All species exist at low population levels in highly roaded areas. Pools filled with sediment support fewer fish and fish suffer higher mortality, while elevated levels of fine sediment adversely affect salmonid embryo survival, decrease fry emergence and juvenile densities, cause loss of winter carrying capacity and increased predation (Bjornn and Reiser 1991; Chapman 1988; Everest et al. 1987; Jensen et al. 2009; Magee et al. 1996; Scrivener and Brownlee 1989; Weaver and Fraley 1993; Young et al. 1991). High sediment load reduces intragravel dissolved oxygen, decreases space for aquatic life, and limits movement of young fry (Bjornn and Reiser 1991; Chapman 1988; Everest et al. 1987; Baird et al. 2012).

Sediment also increases turbidity which reduces aquatic insects and plankton and the foraging efficiency of fish. Sediment fills interstitial spaces in the substrate, reduces habitable area in streams, and when it exceeds 20 percent of the total area on the substrate, smothers fish and frog eggs, increases mortality and reduces aquatic insect and plant production (Bjornn and Reiser 1991). A 20% embeddedness of substrates with sediment fines is a threshold well established in the literature for decline of aquatic habitat (Bjornn and Reiser 1991, Rhodes et al. 2000). While few streams have been measured for embeddedness on the Forest, both Peterson Creek (45%) and Porter Creek (22%) exceeded the 20% embeddedness indicating impairment (USDA Summit OHV FEIS 2016).

Increases in stream temperature are correlated with roads constructed along valley bottoms and next to stream channels that can remove riparian vegetation and canopy cover. Higher stream temperature impacts aquatic species by raising stream temperatures above the tolerable range, increases vulnerability to disease, reduces metabolic efficiency; shifts fish species assemblages, and inhibits upstream migration (Beschta et al. 1987; Hicks et al. 1991). Climate change with warming and drying trends will further impact streams with reduced flows further fragmenting populations and leading to local extinctions.

***Impacts to Wildlife**:* Roads fragment forests by dissecting large patches into smaller pieces and by converting forest interior habitat into edge habitat (Reed et al. 1996). Habitat fragmentation alters the distribution of wildlife species across the landscape and affects functions such as feeding, courtship, breeding, and migration. Fragmentation from roads and other human infrastructure has been identified as one of the greatest threats to biological diversity worldwide (Noss 1987, Wilcove 1987, Noss and Cooperrider 1994). Climate change further compounds the threats of habitat fragmentation and biodiversity loss. As animals migrate due to changing climate, landscape connectivity will be increasingly important to ensure the survival of many species (Hansen et al. 2001; Kettunen et al. 2007).

Road effects are pervasive and include consequences such as population and habitat fragmentation, accelerated rates of soil erosion, and invasion of exotic plants along roadways (Rowland et al. 2005). Reduced habitat connectivity disrupts plant and animal movement and dispersal, resulting in altered population dynamics and reduced potential for recolonization if a species is extirpated from a given habitat (Haddad et al. 2015). Disturbance from roads can create a range of physiological impacts including stress and mortality such as breaking nest-supporting vegetation, collapsed burrows, inner ear bleeding, and vehicle-animal collisions as well as altered behaviors and population distribution/dispersal patterns, which leads to declines in population size, survival, and productivity.

Elk are a “management indicator species” (MIS) for the Forest. Recent studies of elk in Montana showed that motorized routes were the strongest variable that determined elk movement, even more so than canopy cover during hunting seasons (Proffitt et al. 2012, Ranglack et. al. 2016). Significantly greater habitat protection for elk was recommended in order to maintain elk on public lands including recommendations to manage for areas that are at least 5,000-acre blocks of elk security habitat, have greater than 13% canopy cover, and are greater than 1 mile from motorized routes.

The Ochoco Forest is a mixed conifer forest located generally in canyons and draws associated with riparian areas and shrub-scablands occupying ridge tops between forested areas. However, the topography in the Ochoco Mountains is gentler and has higher road densities that are driven by forest users compared to the areas studied in Montana. Leaving large blocks of habitat unfragmented by roads on the Ochoco Forest is particularly important given the gentler topography, high road densities and with ongoing and future impacts of climate change on forest habitats.

***Policy and Implementation*:** As stated above, ML 1 roads are considered “closed” which means they are suitable for nonmotorized uses but closed to motorized traffic and receive minimal custodial maintenance (FEIS p. 512). Appropriate traffic management strategies for closed roads are "prohibit"

and "eliminate" all traffic (FSH 7709.59_63.32). The Forest Service road maintenance guidelines reports the following: ML 1 roads have the following attributes that include but are not limited to: motor vehicular traffic is prohibited, including administrative motor vehicle traffic, and the road entrance is physically blocked or disguised (USDA 2012).

The failure to implement and enforce road maintenance level guidelines by not physically blocking or disguising closed roads continues to impact and degrade fish and wildlife habitat and is a detriment to fish and wildlife populations. The excessively high road density from all ML roads, undesignated routes and unauthorized trails on the landscape causes significant ecological harm. While some roads are included for closure and decommissioning as part of the Black Mountain Project, the road density in the Project area as calculated by the Broads is at a minimum 3.63 mi/mi^2 and likely much greater since it does not include non-system roads, decommissioned and user-created roads that are driven in the Project area. Merely changing the road status during the course of a project implementation and designating roads as a closed road on a map and not physically blocking access allows forest users to continue driving "closed" roads. By continuing to allow high road densities, the Forest fails to address degraded riparian and instream conditions and continues to harm wildlife habitat such as elk security cover.

There are many roads on the Forest. Unlike forest health, road densities are not evaluated in the context of HRV even though in 1870-80 there were few roads on what was eventually designated as the Ochoco Forest. Roads and trails cause forest fragmentation, destroy habitats, and cause disturbance while also providing avenues for the spread of invasive plants, human-caused fire starts, trash, poaching, and increased stream peak flow events which can result in increased sediment loads and degraded stream channels. Habitat disturbance and destruction is further complicated by the impacts of livestock grazing, particularly in riparian areas. Failure to do a complete analysis of all routes and trails in the project area gives a false view of the impacts to the existing habitat condition within the Project area.

Many miles of unauthorized roads and trails on the landscape, whether closed, decommissioned, or user-created, are illegal to drive. When forest users see a road without any noticeable restrictions (i.e., gates, signs, or physical barriers) many people drive these roads in some cases knowing its illegal and in other cases ignorant of road designation. Many members of the public are unaware of Travel Management rules that limit driving to open roads, or they do not have MVUM maps with them when driving on the forest.

There are many reports and surveys done to support environmental documents for proposed vegetation management projects. These can include surveys and analyses of resources for transportation, forest, soils, wildlife, fish and aquatic resources, botany, recreation, and cultural resources. They are intended to evaluate the "affected environment" and "environmental consequences" of a proposed project. In order to adequately assess the transportation system and its impacts on other resources, it is essential that Forest personnel use field-collected data and physically survey all roads in the proposed Project area, including those designated as closed roads or decommissioned, to determine whether they are open and driven by forest users and whether road density standards are met. Project planning efforts should also evaluate unauthorized trails and user-created trails that are driven by forest users with

motorized vehicles. In our study and in a similar study conducted in 2016 by ODFW, we found that over 60% of the closed roads and 33% of the decommissioned roads are not physically closed and are driven by the public. In addition, there were many user-created roads that were seen or documented and a large network of connected unauthorized roads in the upper watersheds of Peterson, Dry Porter and East Porter creeks. Clearly, for the Project area, an assessment of all existing ML roads, undesignated routes and unauthorized trails was not conducted.

Conclusion and Recommendation

We conclude from our road surveys in the Project area that many of the roads identified as closed and decommissioned are in fact not physically closed and the majority are driven. As shown in Figures 3-11, many of the ML 1 roads and decommissioned roads are wide open and forest users drive them. Road densities are much higher than the Project environmental documents state including the FEIS and ROD. Failing to disclose the correct information to the public misrepresents what is happening on the landscape and leads to mistrust of the Forest Service and their actions on public lands. Promising to do work after treatments are implemented ward is disingenuous, especially when the promise for future road closures includes a statement that the Forest "may include trees, rocks, berms or gates" (Black Mountain FEIS p. 108). The use of the word "may" is not the same as the word "shall", the latter which is a commitment while the former is contingent on funding and willpower to do the work.

We appreciate that there are new efforts on the Forest to close some roads although it appears to be largely based on grant funding. We support this work. But we are also concerned that Forest managers may just re-designate ML 2 roads to ML 1 roads for roads proposed for future closures in the Black Mountain Project area as a mapping exercise, with minimal effort to physically block access to "closed roads", both on existing roads on the landscape that are being used and roads proposed for closure and decommissioning.

We recommend three strategies for the Forest to meet their legal obligations identified in the LRMP and policy, law and regulation. First, the analyses and environmental documents for any proposed project must include field surveys of all roads in the project area including but not limited to ML 1-5 roads, undesignated roads (temporary), and unauthorized routes and trails to correctly determine motorized road density and disclose that information to the public. Second, project area mitigation measures must be funded and implemented to physically block or disguise current ML 1 roads, decommissioned roads, and future proposed "closed" roads and user-created roads and trails. These should include using signage, ripping and/or blocking access with locked gates, and physical barriers such as large berms and boulders that ATVs and UTVs cannot breach. Third, increase law enforcement to enforce road closures. When violators are found, assign penalties that are meaningful that could include monetary consequences, forfeiture of vehicles, and community service. To aid law enforcement, we suggest the use of video trail cameras to strategically monitor and document the forest users driving closed, decommissioned roads and user-created roads.

The 2011 Travel Management Plan and subsequent MUVM are now in the 11th year of implementation. To be honest and transparent, the Forest must initiate efforts to effectively manage and enforce the

motor vehicle policy outlined in the TMP and MUVM. The Broads believe that the Forest would likely be in compliance with LRMP standards if Forest staff physically closes or disguises all ML 1 closed, decommissioned, and temporary roads and unauthorized routes and trails, to prevent use.

The Broads will continue to monitor ongoing and future Forest projects to determine compliance with LRMP standards for road densities. It is hoped our monitoring efforts will aid the Forest in project planning and implementation and result in many more effective road closures. We are sharing the results of this report and the table of our results in Appendix A to aid in the closure of many of the closed, decommissioned and user-created roads that are currently driven by the public. Additionally, the Central Oregon Broads have supported the Deschutes, Ochoco and Malheur forests for stewardship projects such as surveys, riparian plantings and weed pulls of invasive species. We extend our volunteerism with service projects to help the Forest monitor and implement road closures.

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Appendix A. Black Mountain Road Surveys by the Great Old Broads for Wilderness, Bitterbrush Broadband. Summer and Fall 2020.
* Roads in the table that are “open” are illegally driven; yellow highlighted roads are main arterial roads

Hickey Meadow / South and West of North Fork Crooked River

Road Number	Open/Closed	Picture (Y/N)	Barrier?	Driven this year?
4230	Legal open			
4230-050	Legal open			
508	Decom			No
570	Decom but open			Yes
704	Decom			No
705	Decom but open		No	Yes, well driven both east & west end
890	Decom			No
902	Decom but open		No	Yes
903	Decom			No
904	Legal open			
906	Legal open			
908	Legal open			
912	Decom but open			Yes
913	Legal open			
914	Decom	Yes	Pasture fence	No
915	Legal open			
916	Decom but open			Yes
917	Legal open			
918	Legal open			
919	Legal open			
920	Legal open			
921	Legal open			
922	Decom			No
923	Decom but open			Yes
924	Legal open			
925	Legal open			
926	Open		No	Lightly driven
927	Open		No	Yes
928	Legal open			Merges into 140
300/900	Legal open			
800	Legal open			
802	Legal open			
809	Decom			
810	Decom			
820	Legal open			
User created road off 820	Open	Yes	No	Well driven from 820

Road Number	Open/Closed	Picture (Y/N)	Barrier?	Driven this year?
821	Legal open			
822	Legal open			
850	Legal open			
851	Decom			
852	open			
855	Legal open			
856	Open			
860	Legal open?			New gravel road; likely newly open road
865	Legal open			
870	Legal open			
4240	Legal open			
4240-050	Legal open			
051	Open	Yes	No	Yes
052	Decom			
053	Decom			Behind fence
051	Open	Yes	No	Yes
054	Decom but open	Yes	No	Yes ATVs
056	Legal open			
061	Closed			
070	Closed			
073	Closed	Yes	No	Little to no use
077	Legal open			
080	Legal open	Yes	No	No use
081	Closed			
082	Closed			
091	Legal open			
092	Legal open			
100	Closed			
110	Legal open			
113/117	Legal open			
140	Legal open			
142	Decom but open	Yes	No	High ATV use
104	Decom			

Allen Creek & North Peterson

Road Number	Open/Closed	Picture (Y/N)	Barrier?	Driven this year?
22 Rd (2200)	Legal open			
550	Lower mile legal open; upper closed			
551	Legal open			
552	Open	No	No	Yes

Road Number	Open/Closed	Picture (Y/N)	Barrier?	Driven this year?
553	Open	Yes	No	Yes
554	Open	Yes	No	Yes
601	Legal open			
602	Legal open			
User created road across from 602	Open	Yes	No	Across from 602 road
603	Open	Yes	No	Yes
604	Decom but open	No	No	Yes
605	Decom but open	No	No	Yes
608	Legal open			
609	Decom			
650	Legal open			
651	Legal open			
653	Legal open			
654	Legal open			
655	Legal open			
656	Decom			
2230	Legal open			
110	?			Not surveyed
114	?			Not surveyed
2630	Legal open			
555	Legal open			
556	Legal open			
557	Legal open			
600	Legal open			
601	Legal open			
606	Legal open			
3010	Legal open			
3010-050	Legal open			
053	Closed			Grown in
054	Closed			Grown in
055	Legal open			
056	Legal open			
080	Open east & west ends	Yes, X from 30-514 on east end	No	Yes
90	Open	No	No	Yes
91	Open	Yes	No	Yes
92	Closed	Yes	Ripped	Yes at least once
94	Closed	Yes	No	Grown in
352	Closed	No	No	Grown in
100	Legal open			
110	Open			Yes
112	Decom			
113	Legal open			
114	Legal open			

Road Number	Open/Closed	Picture (Y/N)	Barrier?	Driven this year?
200	Open	Yes, both ends	Yes small ineffective berm at Yellow Jacket Res	Yes
201	Legal open			
202	Decom but open	Yes	No	Yes
203	Open	Yes	No	Yes
204	Closed	No	Log	No
205	Open	No	No	Yes
206	Closed	No	No	Grown in
New road ~ ¼ mile downhill of Scott Camp	Open	Yes	No	Yes, no #
3010-150	Legal open			
153	Open	No	No	No
154	Closed			
155	Closed			
30 Rd (3000)	Legal open			
30-400	Legal open			
500	Legal open to NW ¼ sec 33 then open beyond tiny berm	Yes, 3 pix	Tiny berm ATVs and 4WD vehicles well driven	Yes, well driven both around berm and over ridge
501	Closed	Yes, 2 pix	No	Grown in
502	Open to 506, then ATV track	Yes	Berm jct with 506	Yes
505	Legal open			
User created road between 505 & 510	Open	Yes	No	Yes, well driven
506	Open	Yes	No	Yes
507	Legal open	Yes		
510	Legal open until jct 511 & 512			
511	Open	Yes	No	Yes
512	Open	Yes	No	Yes
514	Open	Yes	No	Yes
User created road west of 514	Open	Yes	No, but fallen log may deter use until reopened	Yes
550	Legal open			
552	Open	Yes	No	Observed people & vehicles
553	Open	No	No	Yes
554	Legal open			
555	Legal open			

Road Number	Open/Closed	Picture (Y/N)	Barrier?	Driven this year?
556	Legal open			
557	Legal open			
600	Open	Yes	No	Yes, observed people & vehicles
603	Open	Yes	No	Yes

Lower Peterson and West Porter

Road Number	Open/Closed	Picture (Y/N)	Barrier?	Driven this year?
30 (3000)	Open			
050	Legal open			
051	Open	Yes	No	Yes
053	Decom	No	No	No, grown in
100	Legal open			
103	Legal open			North end of 150 road on FS map
104	Legal open			
105	Legal open			
106	Legal open			
107	?			Not surveyed
150	Legal open			
151	Open	Yes	Old ineffective barrier	Yes
180	Legal open			
183	Legal open			
184	Legal open			
185	Legal open			
186	Legal open			
190	Legal open			
191	Legal open			
200	Legal open			
201	Legal open			
202	Legal open			
203	Closed			
204	Decom			
205	Closed	Yes 3	No	Yes
206	Decom			
207	Decom			
250	Legal open			
252	Legal open			
254	Legal open			
300	Legal open			
301	Legal open			
302	Legal open			
303	Legal open			

Road Number	Open/Closed	Picture (Y/N)	Barrier?	Driven this year?
304	Legal open			
350	Open	Yes	No	Well driven
400	Legal open			
450	Open	No	No	Yes
451	Open	Yes 2	No	Yes, camp site
453	Open	Yes	No, berm	Yes
3010	Legal open			
011	Decom but open	Yes 2	No	Yes
012	Decom but open	Yes 1	No	Yes
013	Legal open but blocked	No	Yes Rocks	No
014	Closed	No	Yes Log	No
015	Closed	No	Yes Log	No
016	Closed			
017	Legal open			
018	Legal open			
42 (4200)	Legal open			
109	Legal open			Not on admin map
320	Closed			No
350	Legal open			
353	Legal open			
355	Legal open			
357	Legal open			
358	Closed			
359	?			Not surveyed
360	Legal open			
361	Open		No	Yes, dispersed camp
362	Legal open			
363	Closed			
364	Legal open			
366	Legal open			

East Porter

Road Number	Open/Closed	Picture (Y/N)	Barrier?	Driven this year?
42 (4200)	Legal open			
400	Legal open			
410	Legal open			
419	?			Not surveyed
420	Open	Yes 6 pix	Berm & log; easily driven around	Well driven
421	Legal Open	Yes		Well driven
422	Open	Yes, 2 Track	No	Yes

Road Number	Open/Closed	Picture (Y/N)	Barrier?	Driven this year?
423	Legal Open			
424	?			Not surveyed
425	?			Not surveyed
426	Legal open			
427	Open	Yes	No	ATV tracks to scablands
428	Open		Breached berm	Yes, ATV tracks
430	Legal open			
431	Legal open			
436	Open	Yes	No	Yes
440	Open	Yes	Yes	Yes
441	Closed			
442	Open	No	No	Yes
450	Legal Open			
451	Open	Yes	No	Yes, camp site
453	Open	Yes	No	Yes
454	Open	Yes	No	Yes
455	Legal open			
456	Legal open			
457	Closed			
458	Legal open			

60-Day Notice of Intent to Sue

EXHIBIT B

Letter from Amy Stuart, Fisheries Biologist

April 19, 2022

Oliver Stiefel
Crag Law Center
3141 E Burnside St.
Portland, OR 97214

Re: Review and Comment on the "Forest Plans Amendment – Forest Management Direction for Large Diameter Trees in Eastern Oregon and Southeastern Washington Environmental Assessment" and the Consequences and Impacts to Fish Habitat and Native Fish Populations in Riparian Areas

Dear Mr. Stiefel,

I have reviewed the environmental documents issued by the US Forest Service, Region 6, in the limited National Environmental Policy Act (NEPA) Environmental Assessment (EA) process used to remove the standard from the "Eastside Screens" that formerly protected large mature trees over 21 inches for the past 25 years on six national forests (USDA 2021a) and other related research and literature (Appendix A, Literature Cited). The following are my comments regarding the future impacts and consequences of the removal of protection of trees over 21 inches in riparian areas, including those designated as "riparian habitat conservation areas" (RHCAs), on native fish species. In my letter, I will comment on the importance of large trees in riparian areas and the consequences to native fish habitats, and the lack of adequacy of the environmental documents to fully assess and account for impacts to native fish populations, particularly species listed under the Endangered Species Act (ESA).

I am a fisheries biologist with over 38 years of experience, including 30 years with the Oregon Department of Fish and Wildlife (ODFW) before retiring in February 2014. My work for ODFW included the lands within the Project area including the John Day and Deschutes basins. I was the lead author and co-lead author for research papers on bull trout and redband trout, and restoration of anadromous fish including spring chinook and steelhead in the Deschutes basin. Attached as Appendix B is my resume.

I. Introduction

From the 1960s to the early 1990s, there were few limits on federal land management agencies to control management actions on or near streams (Roper et al. 2019). There were no safeguards to balance the risks posed by increasing timber harvest and a lengthening road system (Hicks et al. 1991; Dose and Roper 1994). This led to simplified stream channels with less instream large woody debris, increased fine sediments in streambeds, and destabilized streambanks (Meehan 1991). This period followed decades (since the 1920s) when management actions such as the construction of valley bottom roads, channel straightening, and log drives had a great direct effect on stream channels (Burnett et al. 2007; Steel et al. 2016). Beschta et al. (1995) reported that "*Land management practices in the interior Columbia… have profoundly impacted forest, grassland, and aquatic ecosystems. Watersheds and forests have been degraded (e.g., ecosystems fragmented, habitats simplified or lost, disturbance regimes altered). At every level of biological organization -- within populations, within assemblages, within species, and across the landscape -- the integrity of biological systems has been severely degraded. This is best seen in the marked reduction in the biological diversity in the region*." The authors further stated that "*By narrowly concentrating on forest health (often a euphemism for tree health, recently referring to carbon cycling), federal land*

managers have embarked on an ambitious attempt to address forest management in ways that risk neglecting watershed health and the ecology of aquatic ecosystems."

One of the primary goals of amending planning documents in the 1990s was to implement new management practices that would support viable native salmonids (Ratner et al. 1997; McHugh et al. 2017). The primary method to improve stream conditions was to limit activities such as timber harvest, road construction, livestock grazing, and other activities near streams that had caused the degradation of streams and riparian areas (Boisjolie et al. 2017; Roper et al. 2018). In addition, there were new policy guidelines to minimize sediment runoff from roads, requirements to conduct watershed scale analysis, identify priority watersheds where aquatic species would have greater protection, and implement stream restoration projects. Concurrent with changes in management policies that were expected to improve streams and riparian areas was a 70% reduction in the quantity of timber harvested from public lands in the Pacific Northwest region (Adams et al. 2006).

The Eastside Screens were implemented in 1994 in order to preserve the relatively few remaining large and old trees, and to protect ecosystem values such as wildlife and stream habitats. Those protections were recently removed by the scientifically controversial decision that the Forest Service implemented when the Undersecretary of the Department of Agriculture signed the Environmental Assessment (EA) Decision Document to remove protections for trees over 21 inches on east side forests in Oregon. Those protections were not in place long enough to restore the large and old trees, and the crucial fish and wildlife habitat they provided for recovery from the past century of logging that had removed the largest and oldest trees in eastern Oregon. There remains a significant deficit of large live and dead trees on the landscape in eastern Oregon as well as a relatively low abundance of the fish and wildlife species that the Eastside Screens were designed to protect and maintain.

Large trees are the foundation of old growth and mature forests, and they have a crucial role in supporting biodiversity, native fish and wildlife including numerous sensitive and Endangered Species Act (ESA) listed species, and clean water (DellaSala and Baker 2020). It is important to retain ALL remaining large trees since they are scarce on a landscape that has experienced decades of high grading timber harvest for large old trees. Large, old trees are also important since they are much more resistant to surviving wildfires. There is a large body of science that shows that increased harvest of large trees results in long-term and irreparable harm to fish and wildlife, ecosystem processes, biodiversity, and water quality. Since the Eastside Screens were implemented in the mid-1990s, the ecological basis for the Screens has not changed.

Since the Eastside Screens were amended, all six eastside forests have proposed projects to cut trees over 21 inches, with some projects including large tree removal in riparian areas. These proposed projects range in size from 35,000 to over 110,000 acres. Thus far three projects, Morgan Nesbit on the Wallowa-Whitman, Ellis on the Umatilla, and South Warner on the Fremont-Winema forests have proposed cutting trees over 21 inches in Riparian Habitat Conservation Areas (RHCAs).

For example, the Ellis project proposes to thin trees up to 9 inches diameter breast height (dbh) in the first 100 feet of the RHCA along fish bearing streams (Category 1), but contains no restrictions on harvest for the next 200 feet to the edge of the RHCA. In Category 2 and 3 streams (perennial and non-fish bearing streams and ponds, lakes and wetlands), harvest is limited for the first 75 feet from the stream but not the remaining 75 feet to the outer edge of the RHCA. Category 4 intermittent streams have even less protection, with restricted harvest only in the first 50 feet from the edge of the stream and no limits to the edge of the RHCA. Another project, Cliff Knox,

proposes logging operations in RHCAs including roadwork and ground-based skidding, and the cutting of trees over 21 inches adjacent to RHCAs.

Even though riparian buffers were established in PACFISH and INFISH to protect riparian areas, streams, and wetlands, the Forest Service has increasingly pursued cutting in RHCAs. The Forest Service has been using silvicultural prescriptions and modifying buffers to eliminate protections for and allow the cutting of large trees that provide critical shade for the streams. The impact of cutting large, mature trees, particularly in mixed conifer forests, old growth, connectivity corridors, and especially in riparian areas, will significantly and directly impact many important functions that old trees provide. Large trees over 21" are important because they support a large variety of fish and wildlife species by providing a multi layered large structural habitat as well as habitat for snag dependent and old growth species, provide shading that preserves clear, cold water for native aquatic species and assists in the improvement of soil health.

II. Riparian areas provide countless benefits for aquatic species.

Riparian areas provide very important ecosystem functions for their associated aquatic environments. Riparian areas, wetlands, seeps, and springs are among the most critical fish and wildlife habitats. Riparian areas provide habitat for over 80% of the native fish and wildlife species in western landscapes. However, riparian areas typically comprise less than 5% and sometimes as little as 1-2% of National Forest lands.

Historically, river systems provided highly complex habitat conditions for a diversity of native salmonids including Chinook salmon, steelhead, bull trout, cutthroat trout, and redband trout populations. Mature forests covered almost 75% of the region's forest types (DellaSala and Baker 2020). Old growth and large mature forests buffered the river system and contributed large quantities of wood to stream channels, forming pools and creating hiding and feeding cover for adult and juvenile fish. Mature trees and streamside riparian vegetation shaded streams, provided connectivity between floodplains and stream channels, and kept water cool for fish production.

Large trees in riparian areas are particularly important, either live or dead, standing or fallen onto the forest floor or into the stream, and are critical to forest and watershed function. In streams, they are referred to as large woody debris (LWD). There is abundant literature on the importance of LWD to the structure, function, and biodiversity of forests and particularly in aquatic ecosystems.

Large trees in riparian areas provide stream-side shading and, when they fall into streams, hiding cover for aquatic species. Large mature trees accrue soil depth, cycle nutrients, mitigate pollution, purify water, release oxygen, and provide habitat for wildlife at levels far superior to logged forests (Mackey et al. 2013, Mackey 2014, Mackey et al. 2014, Brandt et al. 2014).

The bulk of the National Forest System roads were built in the last 50 years, and with a few exceptions, most were constructed for access to timber harvest, particularly along streams and in riparian areas. Given the depletion of large trees over the past century from high grading timber harvest practices, the remaining large trees in riparian areas are all the more important to retain. Large trees provide a far greater benefit than smaller trees since they are critical for forming and retaining high quality pools, they last longer than smaller trees, and are more effective at providing instream habitat and reducing bank erosion.

Forest Service research scientists have repeatedly acknowledged the importance of large old trees for aquatic ecosystems. Hessburg et al. (2020) reported that "*Larger stems with root wads are more effective at creating deep*

plunge pools and side channels than smaller wood pieces because they can deflect greater hydraulic power and they last longer in streams. Smaller stems are often removed by spring flood and other channel reorganizing events...Large trees play a vital role in creating instream structure by adding complexity to stream channels and providing shade, and they are essential to creating high-quality, durable fish habitats…Across a continuum of habitats from the headwaters to the mouth, large wood plays a functional role in the creation of complex habitats for native fish (Fauschet al. 2002, Vannote et al. 1986)." The authors further stated that "Highly complex habitat mosaics reflect a combination of dead trees, log and debris jams, sediment, varying hydraulic power, and stream width (fig. 24). In headwater areas, habitat is often characterized by high-gradient streams. In such environments, large wood moderates flow, providing cold water and micro refugia for fish, salamanders, and other aquatic species (Vannote et al. 1986). Farther downstream, large wood contributes to the complexity of floodplain habitats by slowing water, depositing sediment, and facilitating seasonal flooding. These floodplain environments are highly productive for native fish and are enhanced by the presence of embedded large wood (Jeffres et al. 2008). Large water-adjacent trees often contribute to the complexity of aquatic habitats (Reeves et al. 2018). Large wood slows water, resulting in the deposition of sediment that is then sorted into microhabitats by the water column (Montgomery and Buffington 1997). Instream cover provided by large wood offers critical refuge from predation, particularly for rearing juvenile fishes (Dolloff and Warren 2003). Large wood is also important to the life histories of dozens of species of fish that associate with large wood for cover, spawning, and feeding. Other aquatic organisms such as crayfish freshwater mussels, and turtles also use large wood during part of their life cycles (Dolloff and Warren 2003). Further, large wood with root wads tends to survive longer in the stream channel, providing cover and moderating sediment and flow dynamics more effectively than small wood, which tends to be washed downstream. Shading of stream channels by large riparian trees provides critical thermal regulation and cooling (Poole and Berman 2001), particularly for cold-water dependent fish such as bull trout (Salvelinus confluentus) (Dunham et al. 2011). As climate changes, anticipated thermal stress will further reduce habitat available to native coldwater fish (Falke et al. 2016, Isaak et al. 2017, Rieman et al. 2007). Large trees throughout the river network are important regulators of thermal condition."

Yet, despite these extensive observations on the importance of large old trees to aquatic ecosystems and their importance for fish and other aquatic species, the Eastside Screens amendment removes the protections for large trees in riparian areas.

III. Riparian logging impacts ESA-listed aquatic species—such as Chinook salmon, steelhead, bull trout—and other native fish and aquatic species in many ways, including by impacting nutrient loads, stream temperatures, sediment loads and LWD, all important components for habitat quality.

It is well established that timber harvest and thinning near streams and in riparian areas can harm water quality and fish habitat. An established and growing body of science has documented the negative effects associated with the removal of large, commercial-sized trees. While non-commercial thinning and prescribed burning of fine fuels may only cause a short-term loss of habitat (i.e. a few months or a few years), the impacts from removal of large trees and their canopies, snags and down wood can last decades or longer.

Effects on fish habitat from loss of riparian vegetation include increased stream temperature, loss of cover, increased erosion, a widening and shallowing of the stream channel, and reduction or loss of perennial flow. Degraded habitat is characterized by increased sediment, increased water temperatures, a decline in pool depth, quality and frequency, reduced LWD, increased cutbanks and bank instability, and high width/depth ratios. Water

quantity and quality problems, primarily flow reduction or loss, temperature, sedimentation, and turbidity, limit fish distribution and production (Bottom et al. 1985).

Studies have shown that logging, even selective logging, has increased instream fine sediments (Kreutzweiser et al. 2005, Miserendino and Masi 2010) and increased instream water temperatures (Guenther et al. 2012), and these changes in habitats are found decades after logging.

Most streams on National Forest lands in Eastern Oregon already have high stream temperatures and currently violate state water quality standards for temperature. These high temperatures are a serious and long-term threat to water quality and continue to be a problem due to both past and current land management practices of timber harvest, high road densities and livestock grazing. High stream temperatures, especially in violation of state and Forest Plan stream temperature standards, create chronic and acute lethal conditions for native fish and limit their productivity and survival in areas where they are already stressed by high loads of fine sediments. Even local increases of water temperatures and sediment at the subwatershed or reach scale can cause local extinctions which cannot be recovered (Frissell 2017).

Logging in riparian areas can increase nutrient loads, stream temperature, and sediment to the stream, compromising fish habitat and water quality. Any active management in stream corridors and riparian areas causes a risk of harm to stream ecosystems (Frissell 2017) via the release of nutrients and increases in sediment and stream temperatures.

A. Nutrients. One important function of riparian areas is nutrient filtering and retention from harvest activities up slope. Any vegetation disturbance from wildfires or timber harvest, but especially logging, frees phosphorus and nitrogen in soils and causes a spike of these elements in streams. Excess nitrogen causes increased growth of aquatic plants and algae and in excessive amounts it can use up dissolved oxygen and block light to deeper waters. Too much nitrogen and phosphorus in the water causes algae to grow quickly and beyond what riparian areas and streams can handle. Large increases in algae harms water quality and aquatic habitats and decreases oxygen that fish and other aquatic life need to survive. In large algal blooms, oxygen is depleted leading to toxicity and even death of large numbers of fish. Sweeney and Newbold (2014) reported that "*The most familiar aspect of streamside forest buffers is their role in creating sufficient space to intercept pollutants created by upland activity before they enter the stream. It is intuitive that wider buffers with more vegetation have greater potential for intercepting, sequestering, degrading, and processing pollutants*." The authors conducted modeling of nitrogen removal and, for a site with average water flux, predicted "*removal efficiency of 48% for a 30-m buffer, increasing to 90% for a 100-m buffer*."

Wetlands, like riparian areas, also serve important ecosystem functions, such as improving water quality by filtering sediments, and nutrients and contaminants from the water column (Environmental Protection Agency 2002). Wetlands are also critically essential habitats for a wide variety of plants and animals, including many federally threatened and endangered species.

B. Stream temperature. Timber harvest, particularly in streamside zones, increases water temperature that can become chronic or acutely lethal to native fish species especially salmonids that are adapted to cold water. Yonce et al. (2021) observed that "*The effects of timber harvest on the thermal regime of streams have been observed globally*". The authors stated that "*Reduction in baseflow, which can occur due to soil compaction during harvest, may also reduce the capacity to absorb increased thermal inputs. Preventing these adverse effects was a motivating*

factor in the development of riparian buffer management practices for forestry. Riparian buffers influence water temperature through shading that reduces direct insolation to streams, and secondary effects on microclimate (air temperature and wind) within the buffer are also important. Additional benefits of buffers include reducing peak storm runoff, maintaining stable baseflow, and potentially filtering out sediment, nutrients, and other pollutant loads from the surrounding area."

Stream temperatures are also increased by the interruption of hillslope drainage patterns. By intercepting surface and subsurface flow, and increasing the channels on the landscape, it alters the magnitude of peak flows and lowers base stream discharge (Furniss et al. 1991). Loss of riparian cover and shading from timber harvest is well known while a third mechanism is the conversion of groundwater to surface water (Williams 1999). When water is changed from subsurface to surface water, as streams degrade, it is exposed to solar heating (Fissekis and Hersh-Burdick 2007; Wonzell et al. 2009). The hyporheic zone is the area under or beside a stream channel or floodplain that contributes water to the stream and has been found to have a significant role in supporting cold water refugia for salmonid fish populations.

Stream temperature is also impacted by the density of the road network in watershed. Increases in stream temperature have been strongly correlated with roads constructed along valley bottoms and next to stream channels and from the associated loss of riparian vegetation and canopy cover adjacent to those roads. Higher stream temperature impacts aquatic species by raising stream temperatures above the tolerable range for rearing, and increases vulnerability to disease, reduces metabolic efficiency, shifts fish species assemblages, and inhibits upstream migration (Beschta et al. 1987; Hicks et al. 1991).

C. Sediment. It is well documented in many studies that elevated sediment occurs as a result of timber harvest and the increase of "temporary" roads that continue to have impacts on the landscape well after the project is completed. PACFISH and INFISH both expounded on the contribution of timber harvest and roads to the degradation of streams and listing of anadromous and inland fish species. Many scientists and reports have affirmed that 200-to-300-foot riparian buffers along streams are minimums to protect aquatic habitats. A review of numerous authors in INFISH reported that "*non-channelized sediment flow rarely travels more than 300 feet and that 200-to-300-foot riparian 'filter strips' are generally effective at protecting streams from sediment from non-channelized flow."* Beschta et al. (1995) reported that "*Analysis of sediment impacts, for example, that accept existing conditions as the baseline are highly inappropriate because these have been increased over natural background levels for 50-100 years in many cases. There is considerable evidence that current conditions are insufficient to maintain viable populations of many native species, including sensitive and declining trout, salmon, and other fishes*." The large influxes and biological impacts of sediment beyond those normally in a stream are well documented, and come from timber harvest, roads construction and grazing. Bowerman et al. (2014) reported that fine sediments reduced percolation of water through salmonid redds (fish nests) and impacted both egg and early life survival. The authors also reported that management actions that restore hydraulic complexity in the form of pool–riffle sequences, point bars, and large wood enhance hyporheic exchange and support higher salmonid survival. May and Lee (2004) also stated that "*increases in coarse sediment supply can be associated with sharp reductions in salmonid habitat and productivity*" and reported that streams with discontinuous flow caused by sediment increases reduced survival by crowding fish into smaller areas with reduced food availability. The additional bedload of both fine sediments and coarser sediment delivered to streams fills in the channel, losing pool depth, channel complexity, and changing the channel profile to a shallow, wide profile (Chin et al 2004; May and Lee 2004).

Increased sediment in streams connected with roads causes increased aggradation of stream beds, filling of pools, enlarged channel widths and widening width-to-depth ratios (Jackson and Beschta 1984; Lisle 1982). Lee et al. (1997) (referenced in Carnefix and Frissell 2009) reported as road density increases, there is a clear decline in pool frequency and frequency of large pools, both of which are essential requirements for high-quality fish habitat. Lee et al. (1997) reported that increasing road densities are correlated with declines in the four non-anadromous salmonid species including bull trout, Westslope cutthroat trout, Yellowstone cutthroat trout, and redband trout. All species are less likely to use streams in highly roaded areas for spawning and rearing, and if found are less likely to be at strong population levels. As pools are filled in by sediment, they support fewer fish, and they suffer higher mortality. Elevated levels of fine sediment also adversely affect salmonid embryo survival (Bjornn and Reiser 1991; Jensen et al. 2009) and have been linked to decreased fry emergence and juvenile densities, loss of winter carrying capacity, and increased predation (Chapman 1988; Everest et al. 1987; Scrivener and Brownlee 1989; Magee et al. 1996; Weaver and Fraley 1993; Young et al. 1991). Furthermore, higher fine sediment load reduces intragravel dissolved oxygen, increases metabolic waste concentrations, decreases intergravel space for aquatic life, and restricts movements of alevins (young fry) (Bjornn and Reiser 1991; Chapman 1988; Everest et al. 1987; Baird et al. 2012).

Sedimentation affects fish habitat quality by increasing the amount of fines and causing embeddedness of gravel and substrate. This in turn reduces spawning habitat by making gravel difficult to lift, oxygenation to incubating eggs, and cover for rearing fish. Turbidity affects fish production by reducing production of aquatic insects and plankton, and foraging efficiency of fish. Sediment fills interstitial spaces between rocks in the substrate, reduces habitable area in streams, and when it exceeds 20 percent of the total area on the substrate, can smother fish and frog eggs and increase mortality (Bjornn and Reiser 1991). Increased turbidity reduces the ability of fish to feed on aquatic insects and reduces aquatic insect and plant production. Many streams throughout eastern Oregon forests have documented sediment embeddedness of greater than 20% and in some cases has high as 45% (USDA Summit Off Highway Vehicle Trail (USDA, Ochoco National Forest SFEIS 2016)).

As another example, the US Fish and Wildlife Service (2010) describes the effects of sediment on ESA-listed bull trout: "*The introduction of sediment in excess of natural amounts can have multiple adverse effects on bull trout and their habitat (Rhodes et al. 1994, pp. 16-21; Berry, Rubinstein, Melzian, and Hill 2003, p. 7). The effect of sediment beyond natural background conditions can be fatal at high levels. Embryo survival and subsequent fry emergence success have been highly correlated to percentage of fine material within the streambed (Shepard et al. 1984, pp. 146, 152). Low levels of sediment may result in sublethal and behavioral effects such as increased activity, stress, and emigration rates; loss or reduction of foraging capability; reduced growth and resistance to disease; physical abrasion; clogging of gills; and interference with orientation in homing and migration (McLeay et al. 1987a, p. 671;Newcombe and MacDonald 1991, pp. 72, 76, 77; Barrett, Grossman, and Rosenfeld 1992, p. 437;Lake and Hinch 1999, p. 865;Bash et al. 2001n, p. 9;Watts et al. 2003, p. 551;Vondracek et al. 2003, p. 1005;Berry, Rubinstein, Melzian, and Hill 2003."*

D. Large Woody Debris. LWD is an important measure of habitat complexity and is important for sediment retention, pool formation and bank stability (Cordova 1995; Stuart et al. 2007). It is also an important feature in the physical and biological structure of a forested stream (McDade et al, 1990). In general, higher native salmonid densities are found in streams with more LWD. LWD adds to stream complexity and stability and provides habitat for a variety of species and age classes in aquatic communities (Lisle 2002). Most RHCAs on the managed portions of National

Forest lands are deficient in LWD from past and present timber harvest. Roper et al. (2019), comparing actively managed and reference (unmanaged) reaches of streams on national forests in eastern Oregon and Washington, and Idaho and Montana, reported that wood frequency, wood volume, and pool frequencies all increased as the percent of the riparian zone that was forested increased.

IV. Logging-associated roadbuilding and road use also causes degradation of water quality and adversely impacts ESA-listed and aquatic species.

The Eastside forests all have high road densities, a legacy of logging operations. Roads act like dry stream beds, and when rains come, they push significant amounts of sediments and polluted water into streams and rivers. This is true whether roads are functionally open, designated open or designated closed - the roads continue to have some of the greatest impacts contributing sediment to streams and aquatic habitats.

The ongoing existence of a dense road network has already stressed the system and is causing significant effects. The construction and use of new roads in riparian areas to facilitate timber harvest will only increase the significant impact that roads are having on riparian areas, wetlands, seeps, and springs and associated fish and wildlife species. The Forest Service is already proposing new road construction, the reopening of old roadbeds and new stream crossings to facilitate timber harvest. These actions will dramatically increase the impact of and the amount of sediment being pushed into the system. These are not minor, short-term impacts but large-scale, long-term impacts to aquatic systems that are already on the brink.

Most national forests have road density standards that were implemented as part of the 2005 Travel Management Rule (USDA 2005). The 2005 Travel Management Rule was adopted to address environmental harm resulting from unregulated motorized use across National Forest Service lands. For example, the Ochoco Forest has a road density standard of $\leq$ 3 mi/mi^2 in general forest (USDA, Forest Service 1989 Ochoco Forest Land and Resource Management Plan), yet in their own analysis of roads in 2003, road densities are as high as 12 mi/mi^2 (USDA Forest Service, Roads Analysis 2003). Another example is the Malheur National Forest where there are road density standards of 1.5 mi/mi^2 in big game summer range and 1 mi/mi2 in big game winter range (USDA Forest Service 2021b, Cliff Knox Project DEIS) yet the open road density in the project area is 3.98 mi/mi2 in the area planned for timber harvest. Since there are many closed and decommissioned roads that are either being driven or still present on the landscape in terms of their effects, the real road density is much higher.

In 2020 and 2021, volunteers with the Great Old Broads for Wilderness conducted surveys of "closed and decommissioned roads" in project areas of the Ochoco Forest. The Black Mountain Vegetation Management project DEIS stated that the existing road density was 2.66 mi/mi^2 only using ML 2-5 open roads (USDA, Forest Service 2018, Black Mountain DEIS). However, the Broads noted that counting ML 1 closed roads of which most were driven, the road density for M 1-5 roads was 3.66 mi/mi^2. The Forest Service failed to enumerate the real open road densities on the landscape. The surveys showed that the density was even higher as it found that 63% of the ML-1 "closed" roads, 33% of the decommissioned roads, and numerous user-created roads had unauthorized vehicular use. The surveys noted that 80-90% of the "closed" roads had little or no barriers to restrict access and most had been driven. In another area of the forest, the proposed Mill Creek project area (a project that proposes the removal of large trees greater than 21 inches), the survey crews found a similar level of closed and decommissioned roads actively driven by the public and many user-created roads.

Road density standards and meeting those standards are important because the effects of roads and motorized trails on the landscape concentrate flow and increase runoff and sediment to streams. The increased hydrologic connectivity of flow and sediment seriously degrades instream habitat for aquatic species including macroinvertebrates (aquatic insects), Columbia spotted frog, and a variety of salmonids including native fish such as Chinook salmon, steelhead, bull trout, and redband trout.

Many authors have reported on the consequences of forest management and the attendant proliferation of roads across the landscape. DellaSala et al. (2011) state that "*the roaded, intensively managed landscapes of the other national forest lands have been closely correlated with heavily sediment-laden streams and dramatic changes in flow regimes (Espinosa et al. 1997; Trombulak and Frissell 2000; Center for Biological Diversity et al. 2001; Coffin 2007; Frissell and Carnefix 2007).*"

Elliot et al. (2011) reported that sediment is the greatest pollutant of forest streams, and in the absence of wildfire, a forest road network is usually the main annual source of sediment in forest watersheds. A major factor that increases erosion is traffic. Roads with heavy traffic generate 4 to 5 times the sediment of roads compared to roads with light traffic (Elliot et al. 2010). Carnefix and Frissell (2009) found that there is not a truly "safe" threshold road density for aquatic species, but instead negative impacts begin with the first road segment in a watershed, and highly significant impacts began at road densities as low as 1 mi/mi^2. Motorized use of unpaved roads is a direct factor in sediment production (Furniss et al. 1991). While several research efforts have attempted to describe and quantify increased sediment production for use of roads, some studies have documented that heavily used roads increase sediment production by 130 times greater than abandoned roads (Reid and Dunne 1984). Other studies have documented that sediment production for roads with traffic deliver 2 to 30 times sediment production compared to unused roads (Luce and Black 2001). Foltz et al. (2009) reported that after Forest Service roads were reopened from being closed or decommissioned, sediment concentrations were significantly higher and were attributed to decreased vegetative cover. In addition, the authors found that 30 years of no traffic and vegetation regrowth was not sufficient to allow recovery of soil infiltration to values similar to an undisturbed forest. In other words, the years of compaction by vehicles effectively and permanently impacted runoff and sedimentation from lack of infiltration. Stream crossings along roads are also a major source of sediment to streams (Furniss et al. 1991).

The small roadless areas that have been left "unmanaged", with a lack of logging and roads, play a critical role in maintaining high-quality water and protecting aquatic ecosystems. The clean water from remnant roadless areas is important to maintain healthy coldwater salmonid fisheries, sustain viable aquatic ecosystems, and help protect threatened species and ecosystems (Abell et al. 2000; Trout Unlimited 2004). Roadless area are an important refugia for many salmon and trout populations, as well as for a diversity of endangered freshwater species (Henjum et al. 1994; Huntington 1998; Trombulak and Frissell 2000; Center for Biological Diversity et al. 2001; Strittholt and DellaSala 2001; Oechsli and Frissell 2002; Strittholt et al. 2004; Petersen 2005). DellaSala et al. (2011) state that "*restoration of salmon and trout fisheries in places with high road densities will likely fail without the pivotal role provided by roadless areas as fishery strongholds*." Further, they state that "*For many major drainages (entire watersheds of major rivers, such as the Columbia River Basin), roadless areas and other wilderness areas represent the last few percentages (typically 1% to 5%) of the landscape with a minimally disturbed, or near natural, hydrology*."

V. <u>The FS falsely relies on PACFISH and INFISH to protect streams and riparian areas. By failing to disclose all activities and consequences and relying on PACFISH and INFISH to protect riparian areas, the Forest Service disregards impacts to native fish habitat and fish populations.</u>

The Decision Notice and Finding of No Significant Impact (USDA 2021a) for removing the 21-inch rule of the Eastside Screens states that "*the direction of INFISH and PACFISH, which provide standards and guidelines to protect water quality, continue to apply*" while the Decision Summary states that *"all management will remain the same within Riparian Habitat Conservation Areas. PACFISH, INFISH, their objectives, goals, standards and guidelines direct management will still apply."* Based on this continued management direction, the FS brazenly concludes that the removal of protections for large trees across the Eastside Forests will have "no effect" on ESA-listed aquatic species.

PACFISH and INFISH were designated with the intent to recover highly degraded streams from past and present management activities of timber harvest, roading, mining, and livestock grazing. Timber management activities were only allowed if they were implemented with the intent to move Riparian Management Objectives (RMOs) to a better condition.

However, in the past decade, all forests east of the Cascades have increasingly pursued timber harvest in riparian areas, often under the guise of "restoration" or "wildfire resiliency." In some cases, forests have created arbitrary designations of a "streamside management zone", "an inner and outer RHCA zone" and a "limited activity buffer" that allow commercial harvest and other logging operations in a portion of the RHCA. In some cases, RHCA buffers themselves are too narrow to prevent impacts to aquatic ecosystems, and this further narrowing of buffers has introduced still more impacts. This has led to continued timber harvest, roading and livestock grazing and the failure to recover degraded streams and riparian areas.

Yet, the EA and Decision Notice for amending the Eastside Screens failed to provide any numerical data on stream conditions and parameters for meeting or violating RMOs from PACFISH and INFISH. All six forests that were covered under the EA to remove the 21-inch rule have highly degraded watershed function, streams and riparian conditions throughout all actively managed areas. The few areas that may meet RMOs are typically found in wilderness, roadless areas, and undeveloped lands. The EA and Decision Notice fail to look at baseline conditions and the cumulative effect of removing the protections for large trees across the broad landscape.

The EA and Decision document to amend the Eastside Screens (USDA 2021a) state that "*Aquatic and riparian species habitats are protected through the guidance of the PACFISH/INFISH strategies and will not change under this amendment" and "Project level analyses will be required to address any site-specific effects that projects may have on riparian and wetland associated species and their habitats*."

However, at the site-specific project level, the Forest Service fails to acknowledge that increased sediment from the large planning areas for timber sales will increase impacts on ESA-listed and sensitive aquatic species. For example, the Ellis Integrated Vegetation Management project on the Umatilla National Forest encompasses a planning area of over 114,000 acres for commercial timber harvest, thinning, and additional roads to conduct treatment activities. While the DEIS acknowledged that watersheds and streams were in very poor degraded conditions, the only data provided were that the expected sediment loads would increase from all action alternatives (USDA 2021c, Ellis DEIS and Ellis Hydrology Report). The projected sediment increases are alarmingly high, and in most of the subwatersheds, sediment is expected to increase anywhere from 100% to an astonishing almost 400% over the existing condition during treatment activities. Over 85 miles of streams in the project area are identified as designated critical habitat for ESA-listed Mid-Columbia River steelhead. The DEIS states that there are existing conditions of highly degraded watersheds and streams with elevated water temperatures and elevated sediment, and the project will result in increases of sediment from soil disturbance and loss of shade from the project. Then the DEIS asserts that "*Alternatives 2 and 5 [which will have the greatest amount of harvest and roads]*

would not hinder attainment of relevant properly functioning indicators pertaining to sediment and roads." In other words, the FS found that despite the huge sediment increases caused by the project's riparian logging and associated roadwork, the project is consistent with the PACFISH management direction.

As discussed above, sediment increases of this magnitude pose significant consequences for aquatic species. High sediment loads and water temperatures have already led to the severe decline of ESA-listed Mid-Columbia steelhead. Clearly in the case of the Ellis Integrated project and other projects, impacts to fish habitat and ESA-listed species will continue to occur, notwithstanding the PACFISH/INFISH management direction. Despite severely degraded riparian and stream habitat conditions and watersheds not in proper functioning condition, and the acknowledgement that timber harvest will dramatically increase sediment, the Forest Service continues to authorize riparian logging activities.

Another example is bull trout in the North Fork of the Malheur River that will be impacted by the Cliff Knox project (USDA 2021b). The Forest Service used a U.S. Fish and Wildlife Service process paper titled "A Framework to Assist in Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Bull Trout Subpopulation Watershed Scale" (USDI FWS 1998) to describe the environmental baseline for the project. The ESA-listed bull trout in this area has a subpopulation of less than 50 adults and are found in an 8-mile segment of designated critical habitat of the Malheur river and tributaries in the project area. The Cliff Knox DEIS cites that "*The Malheur River core area was estimated to have 50-250 individuals; however, the short-term trend was determined to be declining. The threat to the species was considered to be substantial, imminent and the population is at a high risk for extinction (USDI FWS 2008b)."* This high-risk bull trout subpopulation is characterized as in rapid decline or maintaining at alarmingly low numbers and under current management, the subpopulation will not improve with two generations (5 to 10 years). Yet, despite degraded habitat conditions with high water temperatures and sediment loads, the Forest Service downplays the impacts of increased sediment and loss of shade from the project and finds that the project is consistent with the INFISH management direction.

The impacts from riparian logging activities have the potential to increase significantly now that the Forest Service is permitted to cut large trees. As discussed previously, large trees are of outsized importance in terms of the benefits they provide to riparian areas, including provision of LWD, retention of fine sediment, and reductions of temperature. Removal of large trees will deplete already degraded systems. When roads are built in riparian areas and roads are constructed to remove large trees, the cumulative impacts from removing large trees will further aggravate seriously degraded conditions, leading to further declines in ESA-listed fish species. Since many of the ESA-listed fish are in dangerously low numbers, further timber harvest and roading will likely lead to local extinctions. Once gone, they cannot be recovered.

High quality forested riparian habitat for ESA-listed fish species is directly linked to the presence and abundance of large old trees. The combination of shade, soil and bank stability, nutrient cycling, and high-quality fish habitat is dependent on the continued existence of trees in riparian areas, particularly large trees since they have longer retention and durability. Bisson et al. (2003) reported that large trees are important to retain in areas with hydrologic connectivity to streams because they provide longer duration habitat structure in floodplains than small trees. Since large old trees have been depleted for over a century it is important to retain all remaining large trees. Continued removal under the guise of stand improvement is based on a silvicultural construct and not based on the habitat needs of ESA-listed species that are already jeopardized by past logging and roading practices.

In sum, the Forest Service's conclusion that the removal of protections for large trees will have "no effect" on ESA-listed aquatic species, based on the PACFISH/INFISH management direction, is insupportable. PACFISH and INFISH fail to prevent against logging-related impacts, and such impacts are likely to increase in magnitude with the removal of large trees. The continued entry into riparian areas via roads to harvest large trees will further compact and disturb soils, remove trees that are important for shade, sediment retention, nutrient cycling, and water quality, and further harm ESA-listed fish species. Yet the Forest Service is proposing to allow removal of large trees under the guise of restoration and wildfire resiliency contrary to the best available science and facts about large trees. One has only to look and compare wilderness and roadless areas to highly managed forested areas to see the last best chinook, steelhead and trout habitat is in the largely untrammeled areas. The quality of fish habitat and the abundance of ESA species are highly impacted by managed habitats due to the removal of large wood and extensive road systems to remove timber. In my opinion, the loss of the Eastside Screens' protections for large trees is another nail in the future coffin for ESA fish species and will likely lead to their extinction.

VI. Conclusion

Large trees in riparian areas are particularly important for a multitude of reasons. They are critical for a myriad of ecosystem services including filtering and providing clean water, shade to reduce water temperature, nutrient cycling, and future wood recruitment for LWD in streams. LWD provides important functions for sediment retention, hiding cover for aquatic species, a substrate for macroinvertebrates as food sources for fish, pool formation, and bank stability. These are important components for high quality habitat that support ESA-listed and sensitive fish species like Spring Chinook, steelhead, and bull, cutthroat and redband trout. Logging and associated roadbuilding activities adversely impact riparian areas in many ways, and such impacts have continued to occur in the last 25 years despite the PACFISH/INFISH management direction. Allowing the cutting of large trees in and around RHCAs—along with associated roadbuilding activities—will trigger increased impacts for riparian ecosystems and further jeopardize the future existence of ESA-listed fish species.

Sincerely,

/*Amy M. Stuart*/electronic signature

Amy M. Stuart, Fish Biologist

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Education:
M.S. 1980, Wildlife Management, Colorado State University, Ft Collins, CO.
B.S. 1977, Wildlife Biology & Management, Cornell University, Ithaca, NY.

PROFESSIONAL EXPERIENCE:

Oregon Department of Fish and Wildlife (ODFW), 9/2007 to 2/2014, Deschutes Watershed Manager

- Supervised 60 professional and technical staff.
- Managed expenditures of a combined budget of $9 million per biennium for 25 cost centers.
- Implemented fish, wildlife, research and habitat program goals, objectives and priorities.

ODFW 7/1997 to 8/2007, Hydro Power Program Biologist, High Desert Region

- Lead for the High Desert Region for re/licensing and compliance for state and federal FERC licensed hydro projects in the Klamath, Deschutes, Hood and Owyhee basins.
- Lead negotiator and/or technical lead for the Pelton Round Butte Settlement Agreement, Klamath Settlement Agreement, and Powerdale hydro project decommissioning.

ODFW, 1/1990 to 6/997, District Fish Biologist (DB), Supervisory FWB (3 1/2 years) and NRS 3 (4 years), Ochoco District, High Desert Region

- Fish program manager for the Ochoco District (7½ years). Hired, supervised, and conducted performance reviews of 1 permanent, several seasonal employees and 3 high school interns.
- Collected and analyzed fish population abundance and distribution, species composition, and harvest; evaluate hatchery stocking, harvest regulations; implement habitat protection/restoration.

ODFW, 2/1988 to 12/1989, Assistant District Fish Biologist II, Ochoco District, High Desert Region

- Implemented the fish management program. Sole fish biologist and assumed lead responsibility; ½ time Ochoco National Forest Fish Biologist: advised fish issues for timber sales and range allotments; conducted fish, habitat surveys and habitat projects. Authored bull trout plan at Lake Billy Chinook.

ODFW, January 1986 to January 1988, Fish Habitat Biologist II, BPA Program, John Day, NE Region

- Implemented habitat program using restoration techniques to improve fish and wildlife habitat: bank stabilization and habitat projects. Implemented contracts and landowner lease agreements. Prepared annual reports. Developed, supervised and administered budgets, personnel, equipment, and ODFW staff.

1977-1986. ODFW Ocean Salmon, US Forest Service, US Army Corps of Engineers, Colorado Mined Land Reclamation, and private timber cruiser.

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Numerous presentations to the Oregon Fish and Wildlife Commission and conservation groups for 20 years on a variety of topics including the Crooked River Basin Fish Management Plan, Annual Fishing Regulations, Hydro Relicensing, anadromous fish reintroduction and several projects in the Hood, Klamath, John Day and Deschutes basins.

November 4, 2016

Paul Dewey

Central Oregon Landwatch

50 SW Bond Street, Suite 4

Bend, Oregon 97702

Re: Review and Comment of the September 2016 Supplemental Final EIS (SFEIS) and Draft Record of Decision (ROD) for the Ochoco National Forest (ONF) proposed Summit Trail System Project (Project) and Forest Plan Amendments.

Dear Mr. Dewey,

I have reviewed the above referenced documents and many other associated documents available on the websites of the USDA Forest Service (USFS) and other research and literature. I also reviewed the 2009 Scoping Letter, 2013 Draft Environmental Impact Statement (DEIS), 2014 Final EIS, and April 2016 Supplemental Draft EIS (SDEIS) for this Project. The following are my comments regarding the planning, analyses and conclusions of the ONF for the Summit Trail Project. In my letter, I will comment on road and trail densities that currently exist and are proposed in the Summit Off-Highway Vehicle (OHV) Project Area, the impacts of OHV trails on hydrology, sediment, and fish, and the adequacy of the environmental documents to fully assess and mitigate for the proposed Project.

I am a fisheries biologist with over 34 years of experience, including 30 years with the Oregon Department of Fish and Wildlife (ODFW) before retiring in February 2014. My work for ODFW included the lands within the Project area. I was the lead author for the ODFW Crooked River Basin Fish Management Plan (Stuart et al. 1996) and was the lead author for a research paper on the redband trout population in this area, "Redband Trout Investigation in the Crooked River Basin" (Stuart et al. 2007). Attached is my resume.

I. Regulatory Background

Regulatory documents for the Summit OHV Project include, among many, the Presidential Executive Orders, numerous federal laws such as the National Forest Management Act (NFMA), the National Environmental Policy Act (NEPA), and the Code of Federal Regulations (CFRs); national Forest Service policy and implementation guidance including the Forest Service Manual (FSM) and Handbook (FSH); Region 6 direction such as the Inland Native Fish Strategy (INFISH), and at the forest level Ochoco Forest Land and Resource Management Plan (LRMP). Other regulatory documents or guidance include the Regional Forester Sensitive Species List, the Aquatic and Riparian Conservation Strategy (ARCS), the 2011 ONF Travel Management Plan (TMP), 2008 Recreation Niche Analysis, 2008 Recreation Facilities Analysis, and 2015 Transportation Roads Analysis.

Executive Order 11644 requires that "areas and trails shall be located to minimize damage to soil, watershed, vegetation or other resources of the public lands." Executive Orders 11989 and 11644 require that the Forest Service must minimize destruction, and loss or degradation of wetlands, including floodplains. Specifically, 11989 requires that, "the respective agency head shall, whenever he determines that the use of off-road vehicles will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trails of the public lands, immediately close such areas or trails to the type of off-road vehicle causing such effects, until such time as he determines that such adverse effects have been eliminated and that measures have been implemented to prevent future recurrence".

Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect impacts to floodplain development wherever there is a practicable alternative.

Executive Order 11990 has the same direction for wetlands. These orders place a very high standard that the ONF has not demonstrated to avoid, minimize or mitigate sufficiently for impacts caused by the proposed Summit OHV Trail Project.

II. The SFEIS fails to disclose the existing number of roads and trails, including open, temporary, closed and decommissioned, and user-created trails on the landscape in the Summit Trail Project Area. By failing to disclose all road, route, and trail densities on the landscape the SFEIS underestimates impacts to streams and aquatic life.

A. The SFEIS fails to adequately analyze the existing number of roads, routes and trails on the landscape, leading to unjustified conclusions that the road, route and trail system with the addition of an OHV trail system will only cause minor short-term impacts to riparian areas, streams, wetlands and the native species that depend on those habitats.

The fundamental issue is that high road and trail densities on the landscape are not shown and analyzed. The SFEIS inconsistently analyzes road and trail densities, sometimes including Maintenance Level (ML) 1 (closed) roads, and sometimes including ML 2-5 which are open roads. By selecting the information using only open roads and not including closed, decommissioned, temporary, and reconstruction roads and user-created trails, it leads the false conclusion that there is insignificant impact to streams, wetlands, riparian areas and aquatic species. The road density information was cherry-picked to lead the reader and the public to the conclusion that a new OHV area would not harm the environment. The SFEIS contains inconsistent information on roads, with some sections sometimes including closed roads in the analyses, other sections only counting open road densities according to the Motor Vehicle Use Map (MVUM), and in many cases, displaying contradictory information. In most cases, closed, temporary, decommissioned, and user-created trails were not included in the analyses.

Starting at the Project level, the SFEIS reported that there are 1820 miles of roads in the Project area (SFEIS p. 56) which encompasses 301,581 acres (471.2 square miles) for an average of 3.86 miles of road/square mile (this estimate does not include temporary roads, decommissioned roads and user-created trails). Subtracting the Lookout Mountain Roadless Area (14,365 acres), Bridge Creek Wilderness (5,355 acres), Old Growth (7,693 acres),

Rock/Cottonwood Roadless Area (5,098 acres), and Round Mountain National Recreation Trail (1,018 acres), which are all largely unroaded areas, yields a roaded Project area of 268,051 acres (418.8 square miles). The estimated ML 1-5 road density for the Project area is 4.77 miles of road/square mile, again not including temporary and decommissioned roads, and user-created trails. Therefore, the remaining Project area violates the road density standards established by the LRMP without counting decommissioned roads, temporary roads and unauthorized user-created trails.

The following table (Table 1) states the management objectives and seasonal closures by area from the ONF LRMP (USFS 1989) and the 2003 Roads Analysis (Table 2-13) (USDA 2003):

Table 1. Road density standards from the ONF LRMP and 2003 Roads Analysis

Road Densities	**Ochoco NF**
Winter Range (LRMP 4-255)	1 m/m^2 During closure (12/1 – 5/1) 3 m/m^2 Outside closure (5/1 – 11/30)
Summer Range (LRMP 4-259)	3 m/m^2 (all year)

The 2003 Roads Analysis stated in Chapter 2 that "In most areas existing open road densities are higher than the identified objectives. The Trail System and Off-Highway Vehicle Management and Development EIS completed by the Ochoco N.F. in 1996 found road densities ranged from 0 to > 12 m/m^2. Average road densities in General Forest and Winter Range designations were 4.01 m/m^2 and 3.14 m/m^2 respectfully." This standard was to be applied to General Forest and General Forest Winter Range management areas, respectively. So, for example, it obviously would not apply to roadless area such as the Lookout Mountain Roadless management area.

In the Hydrology and Aquatics section of the SFEIS, part of the analyses disclosed road densities that included closed roads (ML 1) but did not include temporary roads, decommissioned roads, and user-created trails, while other parts of the analyses only included open roads. For example, the SFEIS used road/trail densities within 300 feet of Riparian Habitat Conservation Areas (RHCAs), and stream crossing densities to evaluate flow and sediment regimes and potential impacts on streams and aquatic life (SFEIS Table 116, p. 221). This information is important because the effects of roads and trails on the landscape concentrate flow and increase runoff and sediment to streams. The increased hydrologic connectivity of flow and sediment seriously degrades instream habitat for aquatic species including macroinvertebrates (aquatic insects), Columbia spotted frog, and native redband trout.

The SFEIS reported that "*A road/trail density rating with less than one mile per square mile was considered low, between 1 and 2.4 miles per square mile was considered moderate, and greater than 2.4 miles per square mile was considered high*" (SFEIS p. 139) and used ML 1-5 roads, but did not include temporary, decommissioned and user-created trails. These ratings were based on a USFS Watershed Condition Classification Guide and seem reasonable. However, stream crossings, which have a high potential to deliver sediment had an arbitrary rating with less than 2.5 crossings per square mile as "low", 2.5 to 3.5 crossings per square mile as "moderate" and greater than 3.5 crossings per square mile as "high". There is no logical explanation or basis for describing these stream crossing densities as low, moderate and high other than looking at the overall ranges of stream crossings for the subwatersheds, and randomly picking from low to high ranges of stream crossing densities. The SFEIS

further did not disclose whether these stream crossings used in the analyses were open roads or all roads including closed roads.

The ONF indicated that approximately 700 miles of user-created OHV routes are in the Project area (SFEIS p. 79) but failed to disclose those estimated numbers of miles by watershed or subwatershed, again making the analysis subjective and without disclosing those impacts. The SFEIS also notes that "*Although the Forest Service does not yet have statistically collected use data for OHVs on the district, forest personnel and the public have observed and reported an increase in the number of riders and a growing network of user-created trails*" (SFEIS p. 70). This discrepancy is further cause for concern since the SFEIS admits that "Since miles of existing user created trails by subwatershed are unknown, these are not accounted for in road/trail density estimates and likely would affect these results" in the flow/sediment analysis and conclusion (SFEIS p. 237).

The fundamental assertion in the Hydrology and Aquatics section is that roads on the ONF have an impact on streams and aquatic life, but then chooses to implement an OHV trail system over the No Action alternative, despite essentially increasing the motorized road/trail densities. The No Action alternative provides the most protection of streams, wetlands and native species that rely on riparian and wetland ecosystems. Numerous authors have documented the impacts of roads and motorized OHV trails on streams, riparian areas and wetlands. The following is a brief summary of the impacts of roads and motorized trails on runoff and sediment that degrade aquatic habitat.

A Brief Summary of Impacts to Aquatic Habitats from Roads and OHVs

Elliot et al. (2011) reported that sediment is the greatest pollutant of forest streams, and in the absence of wildfire, forest road networks is usually the main annual source of sediment in forest watersheds. The authors also reported that a relatively new source of sediment in forested watersheds is from recreation particularly all-terrain vehicle trails. Foltz et al. (2009) reported that roads can become overgrown if not used, but if cleared and used for logging traffic, erosion rates can increase 100 fold. A major factor that increases erosion is traffic. Roads with heavy traffic generate 4 to 5 times the sediment of roads compared to roads with light traffic (Elliot et al. 2010). Carnefix and Frissell (2009) found that there is not truly "safe" threshold road density for aquatic species, but instead negative impacts begin with the first road segment in a watershed, and highly significant impacts began at road densities as low as 1 mi/mi^2.

Motorized use of unpaved roads is a direct factor in sediment production (Furniss et al. 1991). While several research efforts have attempted to describe and quantify increased sediment production for use of roads, some studies have documented that heavily used roads increases sediment production by 130 times greater than abandoned roads (Reid and Dunne 1984). Other studies have documented that sediment production for roads with traffic deliver 2 to 30 times sediment production from unused roads (Luce and Black 2001). Foltz et al. (2009) reported that after Forest Service roads were reopened from being closed or decommissioned, sediment concentrations were significantly higher and were attributed to decreased vegetative cover. In addition, the authors found that 30 years of no traffic and vegetation regrowth was not sufficient to allow recovery of soil infiltration to values similar to an undisturbed forest. In other words, the years of compaction by vehicles effectively and permanently impacted runoff and sedimentation from lack of infiltration. Stream crossings along with roads are also a major source of sediment to streams (Furniss et al. 1991).

Williams (1999) gave an excellent summary of how roads (and therefore by the same mechanisms, OHVs) impact aquatic habitat: Increased sediment in streams connected with roads causes increased aggradation of stream beds, filling of pools, enlarged channel widths and widening width-to-depth ratios (Jackson and Beschta 1984; Lisle 1982). Lee et al. (1997) (referenced in Carnefix and Frissell 2009) reported as road density increases, there is a clear decline in pool frequency and frequency of large pools, both of which are essential requirements for high-quality fish habitat. Lee et al. (1997) reported that increasing road densities are correlated with declines in the four non-anadromous salmonid species including bull trout, westslope cutthroat trout, Yellowstone cutthroat trout, and redband trout. All species are less likely to use streams in highly roaded areas for spawning and rearing, and if found are less likely to be at strong population levels. As pools are filled in by sediment they support fewer fish and they suffer higher mortality. Elevated levels of fine sediment also adversely affect salmonid embryo survival (Bjornn and Reiser 1991; Jensen et al. 2009) and have been linked to decreased fry emergence and juvenile densities, loss of winter carrying capacity, and increased predation (Chapman 1988; Everest et al. 1987; Scrivener and Brownlee 1989; Magee et al. 1996; Weaver and Fraley 1993; Young et al. 1991). Furthermore, higher fine sediment load reduces intragravel dissolved oxygen, increases metabolic waste concentrations, decreases intergravel space for aquatic life, and restricts movements of alevins (young fry) (Bjornn and Reiser 1991; Chapman 1988; Everest et al. 1987; Baird et al. 2012).

Stream temperature can also be impacted by roads, routes and trails. Increases in stream temperature have been strongly correlated with road constructed along valley bottoms and next to stream channels and from loss of riparian vegetation and canopy cover. Higher stream temperature impacts aquatic species by raising stream temperatures above the tolerable range for rearing, and increases vulnerability to disease, reduces metabolic efficiency, shifts fish species assemblages, and inhibits upstream migration (Beschta et al. 1987; Hicks et al. 1991).

The effects of motorized [OHV] trails on watershed processes are similar to roads although they may be lower if the footprint is smaller (Welsh 2008). Erosion rates on trails are in part determined by slope gradient and length, and amount and type of trail use with direct mechanical impacts occurring in the form of abrasion, compaction, shearing and displacement (Meyer 2002). Indirect effects occur in the form of erosion, mostly by water from rainfall or runoff from snowmelt. The SFEIS acknowledged the research done on OHV impacts to trails by Foltz (2006) and Meadows et al. (2008) but then incorrectly stated that "both of these studies need to be qualified with the fact that this study is for unmanaged ATV use" (SFEIS 238). While the Foltz (2006) did look at unmanaged OHV trail use, the Meadows et al. (2008) study was a very thorough research project that looked at how OHVs degrade natural resources from the starting point of no OHV activity, then assessed through carefully controlled experiments of repeated use of an all-terrain vehicle (ATV) on soils on 7 different national forests around the country.

The Meadows et al. (2008) study started each test site with unmotorized use areas. The two national forests that most closely fit the ONF are the Wenatchee Forest in central eastern Washington and the Beaverhead-Deerlodge in western Montana. In Montana site, loop trails were laid out on slopes ranging from 16-25%. The study site on the Wenatchee in Washington was in a planned and yet to be developed area on abandoned logging roads that had been closed to vehicle access for 20-30 years, and were selected for conversion to OHV trails. While there were some differences in soil types and terrains than the ONF, the authors had several revealing conclusions

about impacts of OHV use on natural resources for all 7 forests. In summary, Meadows et al. (2008) noted the following observations and impacts to forest resources:

1) At all 7 forests, natural resources were affected by ATV traffic. Some portions of the previously unused trails changed from low to medium disturbances in 20 to 40 vehicle passes, while high disturbance occurred in 40 to 120 passes. While the number of days required achieving this number of passes varied by location, 20 to 40 passes can be achieved in one weekend from a moderate-sized ATV group, while a high level of disturbance from 40 to 120 passes can be achieved in less than a month, depending on how and how many OHVs use the trails.

2) Following any level of disturbance, runoff and sediment generated on the ATV trails increased by 56 and 625%, respectively, compared to the undisturbed forest floor. ATV trails are "high-runoff, high-sediment producing strips on a low-runoff, low sediment-producing landscape". The authors acknowledged that levels of disturbance can be reduced by proper trail design and maintenance but it was only a reduction and not elimination of impacts.

3) Increased use of ATVS on public lands means that even a small percentage of riders who desire to travel off trails and roads can have considerable effects on natural resources.

4) Lands may be able to rehabilitate after the effects from a few ATV rides across a meadow, but multiple passes across the same area often results in reduced or complete loss in the capacity for natural rehabilitation.

5) ATV use compacted soils, reducing infiltration and increasing runoff, which are the same phenomena that occur on unsurfaced forest roads with motorized use. While vehicle weights and number of passes are different, the mechanisms of traffic causing compaction and increased runoff are similar. Sediment concentrations tended to increase with increasing disturbance levels.

6) ATV trails adversely affected vegetation, soil, water and air by reducing or destroying vegetation, including forest floor litter, exposed and destroyed plant root networks, exposed bare soil, caused soil erosion, and dust migration as a result of bare soils. Soils were compacted, displaced or loosened, and in cases of high intensity rainfall simulation [such as can occur on the ONF during normal wet spring and fall periods and thunderstorms in the summer], freshly disturbed soils on ATV trails produce an average of 10 times more sediment than undisturbed soils.

7) The study results also indicated that regulating ATVs to trails is not enough to protect natural resources. While trail planning and design are key considerations to reduce impacts, it is not possible to completely eliminate impacts, and areas to completely avoid are riparian areas, ridge tops and sensitive wildlife habitats (which has not done for the Summit OV Project).

The discussion about roads and OHV impacts to streams and sediment is really important to understand because OHVs have some of the greatest impacts contributing sediment to streams and aquatic habitats. The SFEIS assertion that impacts will be minimal from the proposed OHV trail system is false. The implementation of <u>any action alternative</u> will significantly impact riparian areas, wetlands, seeps, and springs and associated fish and wildlife species by construction by increasing road/trail densities over the existing condition on the forest. The construction and seasonal use of an additional 100 plus miles (new construction and reopening old road beds) of an OHV trail system and putting in new stream crossings will dramatically increase the risk of further changing the

hydrologic connectivity, adding sediment, and further altering aquatic sediment. These are not minor short term impacts but large scale, long term impacts that will be added to a forest that has severely degraded streams, riparian areas and wetlands.

B. The ONF justifies using only "open" roads from the Motor Vehicle Use Maps as the basis for analyzing road and trail densities. Many, if not most closed roads are driven by the public throughout the recreation season despite the TMP (2011) decision on the ONF.

Motor Vehicle Use Maps (MVUM) are for the public to use to travel on open roads identified in the 2011 Travel Management Plan (TMP), and are just that, maps. They identify for the forest user the "open" roads, but maps do not prevent or enforce users from traveling on closed, decommissioned, user-created roads and trails, particularly with the low level of enforcement (1 law enforcement officer for approximately 1 million acres). As a result, many casual forest users unknowingly travel on "closed" roads (i.e., roads that are not designated "open" on the MVUM) because there are no physical barriers or signs indicating that the road is closed. Adding additional confusion to the situation, another map available to the public, the Ochoco National Forest user map (colored half inch to the mile map), shows roads that are open for traffic but are closed via the MVUM map.

For example the following picture is of a road near Little Summit Creek in the Project area that is "closed" on the MVUM map (Figure 5). This road is shown as an open road available for public use on the ONF user map. There is no gate or sign or any evidence that this road is closed. A forest user is supposed to know this road is closed by having their MVUM map with them in the vehicle while driving on forest and making sure that each road they drive is open. It was noted on a site visit in September 2016 that the 400 spur sign was removed and lying broken on the ground, so a casual forest visitor probably would not know the road number as well.

Figure 5. A "Closed" road in the Project area less than 150 feet from Little Summit Creek. No gate or no obstruction is apparent. Only the MVUM map discloses that this is a "closed" road.

Another example of a “closed” road on the MVUM map is signed with a green dot sign that states the road is closed during the hunting season (Figure 6), yet it’s closed year round on the MVUM map.

Figure 6. A “closed” road on the MVUM map with a sign stating that it’s closed from 3 days prior to the deer rifle season through the elk rifle season, but is technically closed year round.

These photos illustrate that there is no consistency between the MVUM maps and what roads are on the landscape. How is the casual forest user supposed to know which it is? They don’t, so people drive these “closed roads”. On the color ½ inch to the mile forest map, there are roads shown on the map that are closed according to the MVUM. A forest user sees these roads on the colored map and is led to believe that they are open when in reality they are closed.

An example that illustrates the lack of objectivity in conducting the analyses in the SFEIS is a comparison of the maps of the Project area. Below are three pictures (Figures 7) of the same area located in T14S, R23E from the north corner of Little Summit Prairie in the lower right part of the picture to the road along Deep Creek on the left side of the picture. The first map is the MVUM map showing only open roads, the second is the “administrative use map” that shows most of the administrative roads on the landscape (sometimes called the firemen’s map), while the third map shows the designated trail overlaid with the “open roads” from the MVUM map.

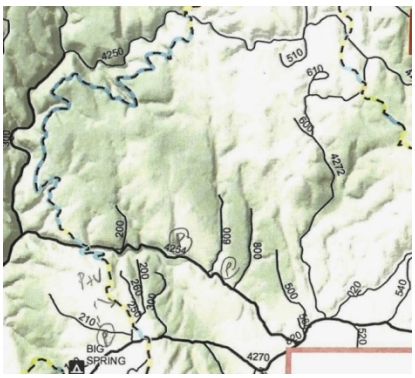


Figure 7-9. Three views of the same area. The first is the MVUM map with "open" roads, the second is the administrative use map with most of the roads, and the thirds is proposed OHV trail map overlaid on the open road MVUM map.

Figures 7 demonstrates that there are 1) a lot more roads on the landscape than were analyzed (compare sections 9 and 10 that show no roads on the MVUM map while the administrative use map shows many miles, and 2) the ONF chose to build an entirely new trail, designated in blue, along the east boundary on the proposed trail map, causing far more disturbance, rather than using the existing road system, some of which are "closed" or "decommissioned".

The USFS Aquatic and Riparian Conservation Strategy (ARCS) (USFS 2008a) set objectives for restoring key watersheds:

> *Developing Objectives for Key Watersheds:*
>
> *Key watersheds should be the highest priority for active, aquatic and riparian restoration. As part of plan revision, each Forest will identify which key watersheds are priorities for active restoration during the life of the plan. Restoration objectives will be prepared for key watersheds identified as high priority by the Forest plan. These objectives will complement programmatic objectives contained in the Regional Aquatic Restoration Strategy (USDA Forest Service, 2005). They will identify priority treatment activities (e.g. improved fish passage, instream habitat improvement, riparian/floodplain vegetation treatments, road stabilization and/or decommissioning), the extent of treatment areas (miles, acres) and timing for completion within individual key watersheds, and blocking up of federal ownership within key watersheds. The objectives should specifically contribute to the maintenance or restoration of desired conditions for each watershed. Source information for development of objectives include watershed analyses and/or plans for the recovery of fish, water or other riparian dependent plant and animal species. Integration and coordination with other Forest Service resource management programs, state and Federal agencies, tribal governments, local communities, land owners and partners is strongly encouraged.*

Then, ARCS cites "standards" for roads and hydroelectric projects (USFS 2008 a, p. 26);

> **Standard KW-1. There shall be no net increase in the mileage of Forest roads, in any key watershed unless doing so results in a reduction in road-related risk to watershed condition. No net increase means that for each mile of new road constructed, at least one mile of road must be decommissioned to hydrologically stable, self-maintaining conditions. Priority should be given to roads that pose the greatest relative ecological risks to riparian and aquatic ecosystems.**

While ARCS may be a strategy document and may not be a regulatory document, it sets a standard that the ONF violates in the Summit Trail Project. In all action alternatives, road/trail densities are increased, leading to the risk of further degradation of riparian areas, wetlands, streams and aquatic habitat.

The Summit OHV Project proposes to rely on roads that are or were closed by other project decisions such as vegetation and fuel treatment projects as "compensation" for high road densities. The SFEIS (p. 73) states that "*With closing and/or decommissioning these roads as authorized in previous NEPA decisions that overlap this analysis area, the road density would be decreased, which would in some areas compensate for the increase in proposed trails*". But by failing to disclose all of the roads and trails on the landscape including open, closed, decommissioned, temporary, and user-created, the impacts to a variety of resources including streams, fish, and wildlife are severely underestimated. The road pictured in Figure 5 is a "closed" road, so the SFEIS assumes in all action alternatives and analyses that no one drives on closed roads and it no longer affects sediment transport, runoff and stream habitat below, which is patently false.

ODFW conducted a recent survey for a 3 week period in late May and early June of 2016 to identify if either wildlife or vehicles were using the roads. Many of the roads surveyed were "closed" per the MVUM map. The survey revealed that 60% of the transects (a subset of segments of roads) on closed roads (via the MVUM map) had vehicle use (Greg Jackle, district wildlife biologist, pers. comm.). ODFW observations as well as my own observations after working and recreating on this forest since the late 1980s discredit the comment in the SFEIS (p. 57) that "*most roads see little use other than administrative traffic and range permittees through the course of the spring and summer…the bulk of use for the majority of roads comes in the late summer and fall, with the commencement of deer and elk hunting seasons*". The implication of the comment from the ONF is that hunters are the majority of people that drive on the forest and they are the law breakers driving closed roads when in fact these closed roads are driven throughout the spring, summer and fall by forest users. The public begins driving all the roads on the forest soon after the snow melts and when they can start punching vehicles through the last remaining snow drifts. It starts with turkey hunters and wood cutters in the spring, and then numerous people travel to the forest for day trips or camping all summer long for hiking, fishing, and wildlife and wildflower viewing, and in the fall there are hunting seasons and more wood cutters.

On a personal note, for the past 3 springs, since the TMP was implemented, my family has hunted much of the Rager area for wild turkeys and we regularly see and hear vehicles illegally driving roads allegedly closed by the TMP MVUM maps. When we encountered a man hunting for turkeys via his OHV, we told him he was driving on closed roads. At first, he stated that it was only closed during the green dot closure, and then admitted that he knew he was driving on closed roads and was going to continue to do so. By late May, virtually every closed road we encountered had been driven by various forest users. My family and I also regularly use the forest through the summer and fall for hiking, camping, wood cutting, viewing wildflowers and wildlife, and fishing and continue to see violations of road closures.

In addition, this past September, the Great Old Broads for Wilderness, of which I am a member, conducted a survey of "closed roads" of several areas in the Summit OHV Project area, including the Deep Creek watershed and the Howard Elliot Johnson area north of Big Summit Prairie. While we have not had time to compile the data yet, we noted that most roads had little or no barriers to restrict access and most closed roads had been driven. In addition, we found new roads that were not on the administrative use map, had no signage, and were not connected to any timber operation, further confirming that most "closed" roads are not effectively blocked or enforced, and new unauthorized roads were created by the public. Approximately 80-90% of the "closed" roads we investigated were not physically blocked in any way.

The ONF, by restricting analysis of roads, routes and trails on the landscape, and then assuming that users only use the MVUM "open" roads, fails to analyze the true impacts of these roads and trails to streams, riparian areas, wetlands and associated species. As the above section illustrates, there are roads everywhere on the forest, and forest users use them whether it's for OHV riding, hunting, woodcutting, or out of just plain ignorance.

C. The ONF uses an unjustified leap of logic that supports implementation of the OHV trail system, despite analyses showing that road/trail densities and road/trail densities within 300 feet of Riparian Habitat Conservation Areas will increase risk of hydrologic connectivity to streams, which further impairs aquatic life.

The SFEIS (p. 58) states that ML1 (closed roads) "*while being maintained at level 1, they are physically closed due to vehicular traffic, but may be open and suitable for non-motorized uses*". Clearly, most closed roads on the forest and in the Project area, are not physically closed to vehicles and *are* being used by forest users. In several places in the Hydrology and Aquatics section of Chapter 3, the following statement is made (example Lower Deep Creek watershed, SFEIS p. 175) "*Based on Forest Service data layers, the Lower Deep Creek Subwatershed was found to have poor total road densities, but fair open road densities. This indicates that road densities are high, but some of these roads are closed and are producing less sediment than the open road system because they are not currently being driven*". So the analysis to use only open road densities is not supported by the fact that many closed roads are driven frequently by forest users. The assertion that they are producing less sediment is untrue.

Further, that statement above about closed roads not being driven is contradicted later in the SFEIS (p. 248) that states "*Given the traditional pattern of "open unless designated closed" on this forest, there are currently large areas with moderate to high levels of human disturbance and predator access*".

In many cases, the SFEIS reports that total (ML 1-5) and open (ML 2-5) road densities within close proximity (300 feet) to stream channels and wetlands are in "poor" condition. For example, the Lower Deep Creek Subwatershed open road densities with the proposed trail were estimated ate 4.3 mi/mi^2 while total road densities (the addition of ML 1 closed roads to the open road estimate) were 5.8 mi/mi^{2,}, a 1.5 mi/mi^2 increase with the addition of the OHV trail. Meanwhile, the Lower Deep Creek Subwatershed (SFEIS p. 175), which is part of the Deep Creek "focus" watershed, has aquatic habitat that is described as "poor"… This is especially true for shade, large woody debris, pool frequency and pool quality. According to Table 116 (SFEIS p. 221), Alternative 5 will increase total road/trail densities in the following subwatersheds: Elliot Creek (4.2 mi/mi^2), Howard Creek (7.5 mi/mi^2), Jackson Creek (5.6 mi/mi^2), Little Summit Creek (7.1 mi/mi^2), Lower Deep Creek (5.8 mi/mi^2), North Wolf Creek (6.5 mi/mi^2), Porter Creek (6.3 mi/mi^2), and Upper Marks Creek (6.4 mi/mi^2). All of these proposed road/trail densities within 300 feet of the RHCA *fail to meet the LRMP road standards and guidelines* for road densities of no greater than 3 mi/mi^2. They are also 2-3 times the criteria of "high" rating of 2.4 mi/mi^2 m so perhaps these road densities should be called "extremely high". With these very high road densities, it substantially increases flow and sediment regimes, further impacting aquatic life. The ONF concludes that the OHV trail system will have a minor "short-term impact" despite analyses that shows the ONF is not meeting INFISH standards and guidelines as amended by INFISH, and also violates the described parameters of a "high" rating. Fundamentally, these streams throughout the forest are in terrible shape, and the watersheds are crisscrossed with very high road densities.

After extensive descriptions of poor stream quality and aquatic habitat parameters throughout the Hydrology and Aquatic section for all subwatersheds (SFEIS p. 131-178), the ONF concludes that implementing any of the action

alternatives does not harm aquatic streams, wetlands and aquatic habitat (SFEIS p. 222). The SFEIS (p. 222-223) states that "*The effects to aquatic species are less than what is displayed in Alternative 2 but greater than those displayed for the No Action Alternative and have adequately been displayed in the EIS…Short-term sediment inputs from trail construction, especially at stream crossings, may have negative effects during construction when turbidity is high. These negative effects may include fish displacement during times of high turbidity, limited feeding, and possible mortality* ". Then, the SFEIS asserts that the Alternative addresses some key hydrologic concerns but is overall more beneficial than Alternative 2, but does not compare Alternative 5 with the No Action Alternative. The ONF makes an illogical conclusion that despite the abysmal conditions of the streams, and very high road densities, that the addition of an OHV trail will have little to no impact. Despite acknowledging short-term impacts during trail construction and stream crossings, the ONF relies on "Project Design Criteria" and the false assumption that forest users will only drive on open roads and not drive closed roads to compensate for OHV impacts to soil erosion, sediment and increased hydrologic connectivity. These conclusions defy logic.

Another problem is that the SFEIS makes contradictory statements such as "*Overall, this alternative [no action] would have the least adverse impacts to streambanks across all Ochoco Summit Project Area subwatersheds. Implementation of a cessation of cross-country travel across the Ochoco National Forest would facilitate a more rapid increase than is presently occurring in bank stability and prevent loss of bank stabilizing riparian vegetation*"(SFEIS p. 181). That comment is contradicted by statement later in the SFEIS (p. 219) that says "*Overall, this alternative [alternative 5] would reduce impacts relative to water quality, in particular sediment and turbidity. In the long term, relative to OHV cross-country travel, sediment and turbidity related water quality would be maintained or slightly improved through an overall reduction in the number of stream and wetland crossing locations, improved stream crossing types, improved trail drainage, reduction in the miles of trail in the vicinity of perennial and intermittent streams, and anticipated decreased peak flow magnitudes*". The SFEIS makes these contradictory statements about impacts of roads and trails on streams, riparian areas, wetlands and aquatic habitat and then again, leaps to conclusions that are irrational.

In the section Action Alternatives, Flow and Sediment Regime, the ONF uses its analyses using only open road densities and combining subwatersheds into watersheds to dilute the impact of the high road/trail densities at the subwatershed level (SFEIS Table 122, p. 232). The case is made that cumulative road/trail densities are below the 3 mi/mi^2 LRMP standard and guideline with the implementation of MVUM maps, and therefore justifies the OHV trail system. This is a great example of the ONF obfuscating the data by throwing out relevant total road densities counting on vegetation and fuels treatment projects to close roads, which may take 10-20 or longer to occur (if ever), and relies on the presumption that forest users will stay off of closed roads. For example, the Canyon Fuels and Vegetation Management Project (FEIS 2010), HEJ Fuels and Vegetation Management (FEIS 2011) and Jackson Fuels and Vegetation Management (2012) are all predicted to take up to 10 years to complete (SFEIS p. 226-227). The failure to use closed and decommissioned roads and user-created trails in the analyses, and the assumption that forest users don't drive closed roads are an arbitrary and capricious thought process and inappropriately leaves out important information to justify the conclusion to choose an action alternative.

D. The ONF has inconsistently applied recent decision documents for land management activities to support conclusions to implement the Summit Trail system. The results are illogical and capricious since the public cannot discern what the intent of the multiple decision documents are, and what the significances are to

streams, road densities, crossings and therefore, subsequent impacts to hydrology, sediment, and aquatic habitats and resources.

There are numerous decision documents from the past 16 years and into the future that are described in the SFEIS (p. 223-230) that cumulatively could impact flow and sediment to the Summit OHV Project (SFEIS p. 231). These are described in Table 7 (SFEIS p. 53) and in the Cumulative Effects for Hydrology and Aquatic Species description of future and ongoing projects (SFEIS p. 223-230). They include a variety of projects such as Howard Elliot Johnson (FEIS 2011), Canyon (FEIS 2010), Jackson (FEIS 2012), Spears (FEIS 2007), Wolf (FEIS 2014), and Gap (2016 FEIS) Fuels and Vegetation Treatment projects, the 2011 Travel Management Plan, the Deep Creek Restoration Project (Environmental Assessment 2004), recent fires (Maxwell 2006, Bailey Butte 2014, Ochoco Complex 2014), allotment management plans, and other projects. The assumption in the SFEIS is made that some of these projects, such as vegetation and fuels treatment, over time, will compensate for the OHV trail and improves watersheds by closing some roads, despite the fact that many of the same projects are treating acres with commercial harvest, pre-commercial harvest and prescribed fire. These same projects will require new road construction, new temporary road construction and reconstruction, building temporary roads on existing disturbance and in some cases decommissioning or closing roads. The problem is the ONF uses some of the same roads for both open and closed roads in multiple decision documents.

A good example is the Howard Elliot Johnson Fuels and Vegetation Management Project (HEJ) (FEIS May 2011). The following figure (Figure 8) shows road status changes under the HEJ Selected Alternative with roads highlighted in yellow and red, as roads that are to be decommissioned and closed, respectively. Many of these were the same roads that were recommended from a Howard Elliot Johnson Porter Roads analysis (2010), which was used as the basis for road status changes for the Project.

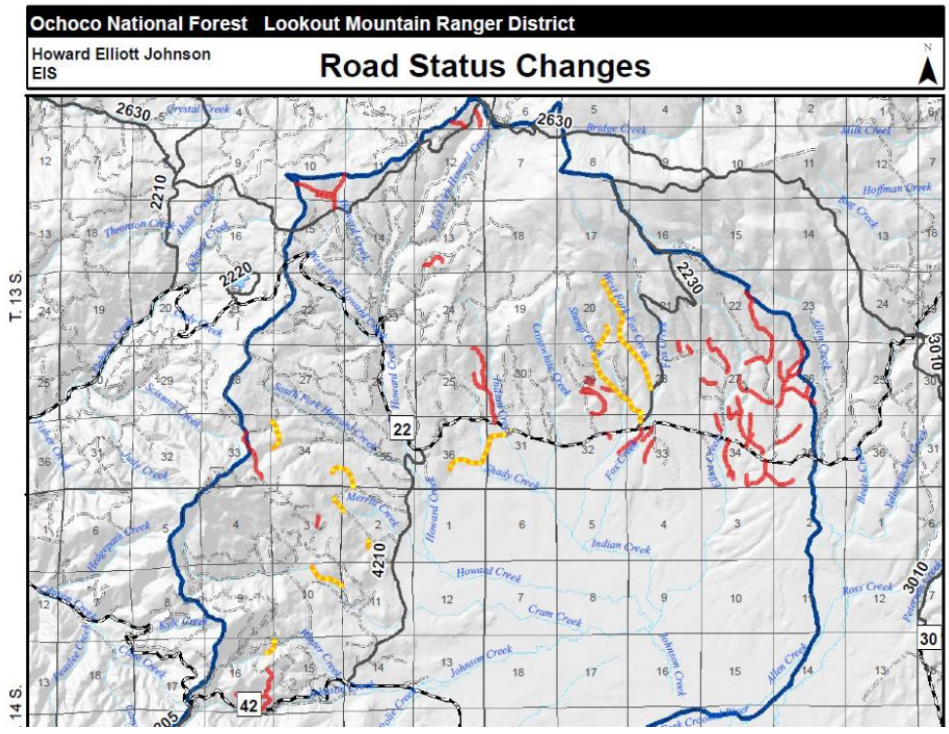


Figure 8. Roads highlighted in yellow and red are proposed for decommissioning and closing in the HEJ FEIS (May 2011 decision).

Subsequent to the HEJ FEIS in May 2011, the TMP FEIS decision was released in August 2011, only 3 months later. Many of these same roads under the 2011 TMP were then left open on all MVUM maps issued from 2012 to 215 (Figure 9). The first decision document intended to close the roads and then was contradicted by a second decision only 3 months later to leave those same roads open.

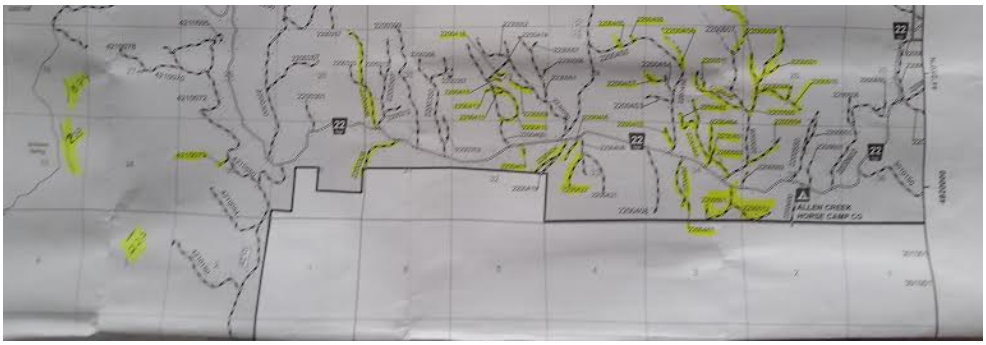


Figure 9. HEJ roads open in the Travel Management Plan MVUM. Roads highlighted in yellow are proposed for closing in the Summit OHV Project.

Then, 5 years later in the Summit OHV Project as a potential cumulative effect, the Summit OHV identifies many of the same roads to be closed or decommissioned in order to move the area toward meeting the LRMP road density of 3 mi/m2 (see Table 1). These alleged road closures/decommissioning are described as "compensation" in the SFEIS (p. 73) "With closing and/or decommissioning these roads as authorized in previous NEPA decisions that overlap this analysis area, the road density would be decreased, which would in some areas compensate for the increase in proposed trails." Tables 2 and 3 are lists of roads proposed for decommissioning or closing, respectively, as "compensation" in the Summit Trails Project in order to reduce open road densities below the LRMP standard and guideline . The tables were taken from Tables 10 and 12 from the Summit Trail Project SFEIS (p. 61-62). Most of the roads that are proposed for decommissioning and closing in the Summit Project are the same roads highlighted in the map for Road Status Changes (Figure 12 above) are for closure/decommissioning under the April 2011 HEJ FEIS.

Table 2. Roads proposed for decommissioning under Howard Johnson Elliot and Porter Creek Subwatershed Roads Analysis (from Table 10 (SFEIS, p. 61).

Creek	Road Number	Segment Length (miles)	Current Maintenance Level	Reason	Recommended Maintenance Level
Elliot Creek	2200-308	0.25	2	Wildlife	Decommission

Elliot Creek	2200-511	0.14	2	Aquatic/Wildlife	Decommission
Johnson Creek	4200-170	0.29	2	Cercla – Amity Mine	Decommission
Johnson Creek	4200-203	0.24	2	Botany/Wildlife	Decommission
Porter Creek	4200-451	0.10	2	Botany/Wildlife	Decommission
Porter Creek	4200-423	0.27	2	Botany/Wildlife	Decommission
Porter Creek	4200-463	0.66	2	Botany/Wildlife	Decommission
Howard Creek	4210-079	0.10	2	Wildlife	Decommission
Total		2.05			

Table 3. Roads proposed to change from Operation Maintenance Level 2 to Operational Maintenance Level 1 – closed under the Howard Johnson Elliot and Porter Subwatersheds Road Analysis (from Table 12 (SFEIS, p. 61-62)).

Creek	Road Number	Segment Length (miles)	Current Maintenance Level	Reason	Recommended Maintenance Level
Howard Creek	2200-274	.35	1	Aquatic	1
Elliot Creek	2200-306	1.2	2	Aquatic, Wildlife/Botany	1
Elliot Creek	2200-401	0.08	2	Botany	1
Elliot Creek	2200-404	0.5	2	Botany	1
Elliot Creek	2200-405	0.2	2	Botany	1
Elliot Creek	2200-410	0.68	2	Wildlife	1
Elliot Creek	2200-411	0.13	2	Wildlife	1
Elliot Creek	2200-412	0.04	2	Wildlife	1
Elliot Creek	2200-417	0.11	2	Wildlife	1
Elliot Creek	2200-418	0.10	2	Wildlife	1
Elliot Creek	2200-422	0.34	2	Botany	1
Elliot Creek	2200-451	0.22	2	Aquatic	1
Elliot Creek	2200-452	0.24	2	Botany	1
Elliot Creek	2200-455	0.21	2	Aquatic	1 (2 segments)
Elliot Creek	2200-457	0.21	2	Aquatic	1
Elliot Creek	2200-458	0.70	2	Wildlife/Aquatics	1 (2 segments)
Elliot Creek	2200-459	0.10	2	Wildlife/Aquatics	1 (2 segments)
Elliot Creek	2200-460	0.54	2	Wildlife/Aquatics	1
Elliot Creek	2200-461	0.13	2	Aquatic/Botany	1
Elliot Creek	2200-462	0.66	2	Aquatic/Botany	1
Elliot Creek	2200-463	0.36	2	Wildlife/Botany	1
Elliot Creek	2200-464	0.33	2	Aquatic	1
Elliot Creek	2200-500	0.30	2	Wildlife	1
Elliot Creek	2200-501	0.63	2	Wildlife/Botany	1
Elliot Creek	2200-503	0.27	2	Botany	1
Elliot Creek	2200-504	0.42	2	Aquatic	1
Elliot Creek	2200-505	1.04	2	Aquatic	1
Elliot Creek	2200-506	0.70	2	Aquatic	1
Elliot Creek	2200-507	1.18	2	Aquatic/Wildlife	1 (2 segments)
Elliot Creek	2200-508	0.49	2	Aquatic	1
Elliot Creek	2200-509	0.32	2	Aquatic/Wildlife	1

Elliot Creek	2200-510	0.10	2	Wildlife	1
Elliot Creek	2200-512	0.48	2	Wildlife	1
Elliot Creek	2200-521	0.18	2	Wildlife	1
Elliot Creek	2230-058	0.21	2	Wildlife	1
Howard Creek	2630-358	0.52	2	Botany	1
Howard Creek	2630-368	0.25	2	Botany	1
Howard Creek	2630-369	0.56	2	Botany	1
Howard Creek	2630-403	0.24	2	Wildlife	1
Howard Creek	2630-408	0.25	2	Wildlife	1
Porter Creek	3000-550	4.78	2	Aquatic	Trail
Porter Creek	3010-095	0.05	2	Wildlife	1
Johnson Creek	4200-153	0.84	2	Aquatic	1
Johnson Creek	4200-175	0.46	2	Aquatic	1
Johnson Creek	4200-227	0.16	2	Wildlife	1
Howard Creek	4200-233	0.56	2	Aquatic	1
Total		22.46			

Essentially, the roads highlighted in yellow in the 2 previous tables are slated for closure/decommissioning in the HEJ project, but are identified as "open" in the MVUM. To further confuse the reader, these same roads are now proposed for closing to compensate for the addition of the Summit OHV trails. Roads highlighted in yellow in the 2 previous tables are the roads proposed for decision documents. The road highlighted in green is in the Porter Creek subwatershed, is not part of the HEJ project, is intended to be a trail in the Summit Trail system but is counted as a closed road in the mileage of the HEJ table to reduce road densities in the Howard Elliot and Johnson subwatersheds.

The SFEIS further noted that (SFEIS p. 64) Road Analyses are not decisions, but only provide recommendations. The Ochoco Summit Project states that it "*does not propose to close any roads regardless of road analysis recommendations*" (SFEIS p. 64). But in fact, this is a defacto claim for compensation for the Summit Trail Project for intended road closures under the HEJ FEIS decision as it further states in the SFEIS (p. 73) that "With closing and/or decommissioning these roads as authorized in previous NEPA decisions that overlap this analysis area, the road density would be decreased, which would in some areas compensate for the increase in proposed trails."

Clearly, the ONF is muddying what is going on with roads. The significance of this road closing and decommissioning, then opening via the MVUM maps, then closing/decommissioning exercise via the Summit OHV Project, is that there are 3 different NEPA decision documents with different conclusions on whether these roads are supposed to be open or closed. How is the public supposed to know whether these roads are open, closed or decommissioned? The ONF cannot legitimately claim these roads for lowering road densities in order to "compensate" for the OHV trail.

I did this same exercise for the Deep Creek Watershed, looking at other decision documents and found the same inconsistencies in designating open, closed and decommissioned roads. The ONF has no believability in identifying open or closed roads, because there is no consistency between multiple NEPA decision documents. The ONF cannot convincingly discount closed or decommissioned roads from other projects to compensate for

the Summit Project, especially when they are open on the MVUM maps. The ONF is inconsistent in its analyses on the landscape and inconsistent in multiple decision documents.

Due to impacts of high road densities and user-created trails the ONF cannot objectively evaluate and account for all impacts to the hydrology and aquatic resources. They cannot adequately assess impacts to flow and sediment regimes, as well as impacts to streams, riparian areas, wetlands and aquatic habitat. Further, the ONF cannot justify using roads that were intended for closure/decommissioning in the HEJ FEIS, then designated as open roads on the MVUM, and then justify these same roads for closure/decommissioning to add the Summit Trail system. In all cases, this smokescreen of the roads analysis leads to underestimating impacts to hydrologic connectivity, runoff, erosion, sediment and subsequent alteration of stream flows and sediments, which in turn, lead to significant degradation of water quantity, water quality and aquatic habitat.

III. OHV Impacts on Soils and Erosion, Sediment, Hydrology, Channel Morphology, Riparian Areas and Wetlands and Fish.

The following discussion summarizes the impacts of OHVs on soils and erosion, sedimentation, hydrologic connectivity, and resultant impacts to channel effects and aquatic habitat.

Impacts to Soils and Erosion

OHVs weigh several hundred pounds and compress and compact soils, and thereby reduces soil absorption, its ability to retain soil moisture (Brooks and Lair 2005; Jones 1999; Wilshire and Nakata 1976), decreases soil fertility by harming microscopic organisms that provide nutrients and increases overland surface flow across the ground (Sack and da Luz 2003, Meadows et al. 2008). Increased compaction of soils causes decreased soil permeability, resulting in high surface flows across the ground and reduced absorption into the soil. Increased flows concentrate water and increases erosion (Wilshire et al. 1978; Webb 1983).

Webb (1983) used a "dirt bike" to evaluate soil conditions after multiple passes over a test plot. One, ten, 100, and 200 passes were conducted to evaluate impacts of each level of use. The author noted that that compaction usually occurred just below the surface and ranged up to one meter deep. Multiple passes showed that compaction increased and infiltration decreased with increased number of passes. At the beginning of the experiment, tire tracks were observed after just one pass, while most annual vegetation was removed after ten passes. Berms of soils formed at the trail sides by the 100- and 200-passes and the center was rutted.

In a controlled study on ATV effects on soil disturbance on 7 different national forests (Meadows et al. 2008), the authors reported that "some portion of the trail transitioned from low to medium disturbance class in 20 to 40 passes. While the number of days required to achieve this number of passes varies from location to location, this level of ATV traffic could be achieved in one weekend from a moderate-sized ATV group". Similarly, all seven forests had test sites that some portion of the trails transitioned from medium to high disturbance in 40 to 120 passes, which the authors estimated would occur in less than a month, depending upon trail usage.

The knobby tires that help OHVs climb hills increase direct erosion of soils (Switalski and Jones 2012). The surface flow increases soil erosion and adds sediment to streams. When an OHV enters a stream crossing, no matter the size of the stream, from ephemeral to perennial flow, there is mechanical removal of soils from the bank that are

transported into the stream whenever there is flow. OHV use on trails is a significant source of fine sediment in streams (Chin et al. 2004, Ayala et al. 2005).

The following is a summary of the impacts of OHVs to soil and erosion from Switalski and Jones (2012): In areas with OHV use, OHVs primarily accelerate soil erosion and remove vegetation, and secondarily increase precipitation runoff of precipitation. OHVs also produce large amounts of dust and airborne particles and lead to wind erosion and air quality problems. The knobby, cup-shaped tires that help OHVs climb slopes cause major erosion and soil loss. As the tires dig into the soil, the mechanical forces far greater than the soil strength result in a "rooster tail" of soil and plants thrown behind the OHV. In an Ohio forest, Sack and da Luz (2003) measured erosion soil losses in high-use ORV areas as high as 209 kg/m2 while Meadows et al. (2008) reported that ATV trails on Forest Service lands produced an average of 10 times more sediment that undisturbed soils. Foltz (2006) demonstrated in an experiment that sediment loss increased with increased ORV traffic, with the greatest losses when trails were wet.

Mechanical erosion on steep slopes can cause soft soils to erode as much as 40 tons/mi. (Wilshire 1992; reference from Switalski and Jones 2008). On moderate slopes, erosion rates on OHV trails can surpass natural erosion rates by 10 to 20 fold (Iverson et al. 1981, Hinckley et al. 1983; both referenced in Brooks and Lair 2005), while trails on steep slopes can completely remove the entire soil layer, exposing bedrock. Several authors measured erosion losses in high use ORV areas. They ranged from 1.4-242 lbs./ft.2 (Wilshire 1977) to 102-614 lbs/ft.2 (Webb et al. 1978; referenced in Switalski and Jones 2008), while Sack and da Luz (2003) reported soil erosion losses of more than 200 lbs. of soil for every 100 ft. of trail each year.

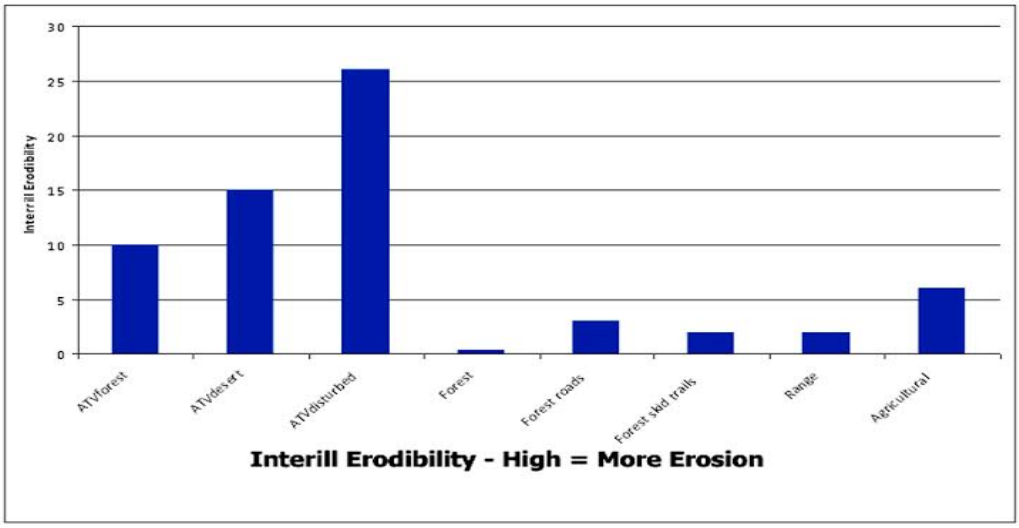
(Schubert and Associates 1999; referenced in Switalski and Jones 2008) analyzed more than 500 soils at more than 200 sites and found that essentially all types of soils are susceptible to OHV impairment. Clay-rich soils, while less susceptible to direct mechanical dislodgment by OHVs have greater rates of erosion than most other soil types. When compacted, soils with high clay content produce a tough surface seal that intensifies runoff and gullying. Conversely, sand and gravel soils are more subject to direct excavation by OHVs, and when stripped of vegetation are more prone to rapid erosion by rilling and gully erosion.

Sediment

Several recent studies have documented ORV use on trails to be a significant source of fine sediment in streams (Chin et al. 2004, Ayala et al. 2005, and Welsh 2008).

Foltz (2006) concluded from his study of ATV impacts on sediment production that there was no statistical difference between levels of disturbance, in other words, a trail section was either undisturbed or disturbed. Marion et al. (2014) found that OHV impacts were spread downstream of stream channel crossings. Most fine sediment was deposited in the immediate vicinity of stream crossings, but deposits of fine sediment were found at least 100 to 200 m downstream, sometimes continuing into receiving streams. Reidel (2006) studied designated OHV trails and found that suspended sediment concentrations and transport on OHV-impacted streams was many times greater than the control stream. Exiting the stream, OHV wheels spin into the bank causing erosion and further increasing sediment loading.

Meadows et al. (2008) documented that *any* level of disturbance by OHVs increased runoff and sediment by 56% and 625%, respectively, compared to an undisturbed forest floor. Using Foltz' data (Foltz 2006), Tom Davis, a central Oregon retired hydrologist and water resources engineer, took the high values of erosion observed on six national forests from the Missouri westward, and graphed the results, demonstrating the high impact of OHVs on disturbed forest lands (Figure 10) (T. Davis, retired hydrologist, pers. comm.):



Erosion From All Terrain Vehicle (ATV) Trails on National Forest Lands
Randy B. Foltz, Research Engineer, PhD
USDA Forest Service, Rocky Mountain Research Station, 1221 S. Main St., Moscow, ID 83843, rfoltz@fs.fed.us

Figure 10. Comparison of interill erodibility on forest lands. Interill erodibility is a measure of raindrop soil erosion with a unit of measure as kg s m^{-4}. High values are for the combined observations of 6 national forests. Higher erosion values occurred on ATV-disturbed sites compared to sites without ATV use (Foltz 2006).

In addition, sediment delivery to streams can occur long after the original impact, and even up to 100 years after the original impact occurred. The following is a statement to Tom Davis, PE; from a Rocky Mountain Research Station Team Leader (Trimble 2009), US Forest Service:

> *"Sediment coming into and going out of a stream system is cited in Stan Trimble's paper: http://www.sciencemag.org/cgi/content/full/285/5431/1244. This is a classic paper about sediment processes, sediment routing equilibrium and massive deposition. Even though it is information from an agriculture watershed in Wisconsin, the principles are the same. When there is a large risk of erosion in a watershed, like a wildfire or logging practices 100 years ago, massive amounts of sediment get deposited in the watershed. Caspar Creek in N. CA is a forest example of this when redwoods were first removed a century ago. It is still delivering unusually large amounts of sediment even though the forest is now regrown. In forests, roads tend to buck the natural trend by delivering small amounts of sediment EVERY year, rather than the sediment pulses that characterize the disturbance driven forested ecosystems."*

Hydrology and Channel Morphology

OHVs cause serious damage to streams by increasing erosion and essentially creating new "channels" of bare dirt that deliver runoff and sediment (Switalski and Jones 2008, Foltz 2006, Meadows et al. 2008). The most serious impact is in the immediate vicinity of stream crossings but the impacts can occur from streamside to hundreds of feet upslope from streams. As riparian vegetation is removed by vehicles, plant root networks are destroyed, bare soils are exposed and eroded, and the hydrologic stream network increases (Meadows et al. 2008). Subsequently, stream channels widen and sediment is deposited into stream reaches below the points of delivery. Road networks and stream crossings increase the drainage or hydrologic network and erosion, while the downstream effects are sediment and alteration of peak flow event (Forman and Alexander 1998). Even if OHVs are not directly crossing streams, sediment is delivered to the streams by the increased network of delivery caused by the OHV trails.

Stream crossing cause changes in channel width and slope both upstream and downstream of the crossings (Heede 1980). These alterations in channel morphology can continue for long period of time. Roads [and by virtue of similar mechanics] concentrate and divert flow in headwater areas and cause incisions in areas of the landscape not previously channelized (Montgomery 1994).

Recent research demonstrated that on a designated trail system that had been in place since 1992 OHVs crossings significantly widen stream channels by obliterating the banks and typically the channel widths of the cross section immediately upstream of the OHV crossings (Marion et al. 2014). Overall, stream crossings ranged from 1.15 to 5.45 times wider than the upstream section. A third of the sites also had increases or very large increases in downstream bank erosion. Analysis of the fords showed geomorphic impacts resulting from OHV use including channel erosion and widening,

Riparian Areas and Wetlands

Some ecosystems such as riparian areas and wetlands are rare and disproportionally ecologically and socially important (Switalski and Jones 2008). These special ecosystems are especially important for management since they are more sensitive and more vulnerable to destruction from OHVs, and/or because their impairment is more important by virtue of their scarcity. While riparian areas and wetlands make up just a small percentage of forestlands, they are generally more productive in plant and animal biomass and higher in species biodiversity than the surrounding areas. Good riparian habitat conditions result in cool water, and directly influence instream habitat by maintaining stable streambanks, good water quality, and late season flows (Stuart et al. 1996).

Wetlands also serve important ecosystem functions, such as improving water quality by filtering sediments, and nutrients and contaminants from the water column (Environmental Protection Agency 2002). Wetlands are also critically essential habitats for a wide variety of plants and animals, including many federally threatened and endangered species, and amphibian populations such as the Columbia spotted frog, a highly aquatic federal species of concern.

Aquatic Habitat

River and streambanks in many places of the Crooked River basin including headwater tributaries on the ONF lack riparian vegetation, cover, and large woody debris and are actively eroding or unstable (Stuart et al. 1996). Effects on fish habitat from loss of riparian vegetation include increased stream temperature, loss of cover, increased erosion, a widening and shallowing of the stream channel, and reduction or loss of perennial flow. Degraded habitat is characterized by increased sediment, increased water temperatures, a decline in pool depth, quality and frequency, reduced large woody material (LWM), increased cutbanks and bank instability, and high width/depth ratios. Water quantity and quality problems, primarily flow reduction or loss, temperature, sedimentation, and turbidity, limit fish distribution and production (Bottom et al. 1985; referenced in Stuart et al. 1996). If an illegal OHV user violates a trail system and crosses perennial or intermittent streams that are fish-bearing, they have the potential to drive over redds (salmonid spawning nests built in the substrate), crush or disrupt incubating eggs and increase sediment transport in the water.

Fine sediments and turbidity reduce spawning habitat, egg survival, and food production of insects and plankton (Stuart et al. 1996). Sedimentation affects quality of fish habitat increasing the amount of fines and causing embeddedness of gravel and substrate. This in turn reduces spawning habitat by making gravel difficult to lift, oxygenation to incubating eggs, and cover for rearing fish. Turbidity affects fish production by reducing production of aquatic insects and plankton, and foraging efficiency of fish. Sediment fills interstitial spaces between rocks in the substrate, reduces habitable area in streams, and when it exceeds 20 percent of the total area on the substrate, can smother fish and frog eggs and increase mortality (Bjornn and Reiser 1991). Increased turbidity reduces the ability of fish to feed on aquatic insects and reduces aquatic insect and plant production.

The additional bedload of both fine sediments and coarser sediment delivered to streams fills in the channel, losing pool depth, channel complexity, and changing the channel profile to a shallow, wide profile (Chin et al 2004; May and Lee 2004). Chin et al. (2004) conducted a study of OHV effects on streams, comparing pool characteristics in two watersheds with OHV trails to those in two control watersheds. The OHV-impacted streams had pools with higher percentages of sand and fine sediments. They also had shallower pools with reduced pool volumes, along with higher turbidity, all of which are signs of degraded habitat quality. The second study used tracers and found that an OHV trail had massive impacts on water quality, sediment yield and stream bed sedimentation, and resultant impacts on the stream ecosystem.

LWM is an important measure of habitat complexity and is often associated with pool formation and bank stability (Cordova 1995; Stuart et al. 2007). It is also an important feature in the physical and biological structure of a forested stream (McDade et al, 1990). In general, higher native trout densities are found in streams with more LWM. LWM adds to stream complexity and stability and provides habitat for a variety of species and age classes in aquatic communities (Lisle 2002).

After flow, high summer water temperatures are probably the second largest factor affecting fish in the Crooked River basin (Stuart et al. 1996). Optimal stream temperatures for rainbow trout are 54^{o} to 64^{o}F. Water temperatures in headwater streams on the ONF often exceed 70^{o}F and have been recorded as high as 83^{o}F, well

in excess of state water quality standards for the Deschutes Basin. High water temperatures result in stress or direct mortality to cold water fish species and increases competition from nongame species such as suckers, chiselmouth, and northern pikeminnow, which can tolerate higher temperatures.

The SFEIS failed to properly analyze impacts caused by OHVs

SFEIS states that "*Implementation of the no action alternative would provide for the greatest improvements to streambank alteration and vegetative conditions in the shortest time frame. There would be no all-terrain vehicles crossing streams, directly impacting streambanks at crossing locations. There would be no further effects to width-to-depth ratio, entrenchment, or sediment yield than what currently exists. In addition, by reducing the density of user-created roads and stream crossings, peak flows would not be affected or would slightly decrease as a result, in turn maintaining or slightly decreasing bank erosion of stream crossings*" (SFEIS p. 180).

All action alternatives, however, increase the number of stream crossings and road/trail densities and claim that while the new trails may temporarily increase sediment production, that in the long term, the implementation of Project Design Criteria (SFEIS p. 29-30 and p. 31-33) and rehabilitation of user-created trails in each action alternative would have the result of reducing sediment delivery to streams. For example, the SFEIS (p. 218) concludes that "*In the short-term with the implementation of Alternative 5, impacts of the addition of trails on the flow and sediment regimes would increase. However, in the long-term, once most user-created trails have revegetated (or are rehabilitated/restored (as prioritized), impacts to watersheds flow and sediment regimes should decrease to levels below the existing condition. Proposed trails in Alternative 5 would increase the overall road/trail density and stream crossing density. Increased road/trail densities have the potential to increase drainage density, resulting in increased connectivity and peak flow magnitudes. However, the trail system, as designed in Alternative 5, would not exacerbate existing water quality issues, because of appropriate design criteria and proper management and maintenance*."

The ONF failed to adequately compare the no action alternative to the proposed action alternatives that implement varying lengths of the new OHV trail system and fail to disclose the real impacts. The Alternative 5 displays open road and total road densities comparing alternative 5 with alternative 2 (SFEIS Table 114, p. 218), and another table displays miles of existing roads and proposed trails within 300 feet of streams, comparing alternatives 3 and 5 (SFEIS Table 116, p. 221). But there is no comparison of road/trail densities in the action alternatives with the No Action Alternative, so the public cannot discern the original road/trail densities in each subwatershed or in each subwatershed within 300 feet of streams, and therefore cannot compare impacts of each action alternative OHV trail system.

Also, while the Hydrology and Aquatics section compares increases in road and trail densities including ML 1 (closed roads) in Table 16 (SFEIS p. 221), other roads such as user-created trails, temporary roads from vegetation and fuels treatment projects, reconstructed roads, and decommissioned roads are not accounted for in the analyses. These other types of trails and roads such as user-created trails, temporary roads and decommissioned roads have the same effect on the landscape of channeling water and delivering sediment to streams, although magnitudes differ by how actively these roads and trails are driven. The SFEIS acknowledges that an "*Increase in overall subwatershed road/trail densities and stream crossing densities have the potential to increase connectivity between roads, trails and streams resulting in higher peak flows and changes to peak flow timing…Since miles of*

existing user-created trails by subwatershed are unknown, these are not accounted for in road/trail density estimates and likely would affect these results" (SFEIS p. 236-7), but there is no attempt to estimate these impacts.

Then, the SFEIS goes on to state that "*Additionally, a prioritization of unauthorized trails would be stabilized or restored as funds allow, which would be beneficial to aquatic species and water resources*"… "*Alternative 5 has the least number of site-specific concerns, and all trails proposed within areas of concern are Class III trail motorcycle trails, which are expected to have the least impact of all three trail classes*" (SFEIS p. 238). There are two flaws in these last two statements. First, the action alternatives are not compared to the No action alternative in any numerical or tabular way, they are just statements telling the public to trust them, and all will be well. In the absence of displaying action alternatives with the no action alternative with numerical information such as total road/trail densities, the public is not allowed to view the real impacts of each action alternative. The second problem is that the ONF claims that public funds will provide the Band-Aids to restore unauthorized user-created trails. The latter is a speculative assumption since grant funding is competitive and grant awards are unpredictable.

The SFEIS (p. 237) makes the assumption that with "*all action alternatives include hydrologically stabilizing and closing unauthorized trails that are not part of the Ochoco Summit trail system, which would help decrease the amount of time for recovery and eliminate sediment and other stream impacts once implemented* ". This is a frivolous assumption contradicted by research and literature (e.g. Meadows et al. 2008). Once a motorized trail is developed, it is irreversible and there will be increased hydrologic connectivity to streams and increased sediment input, no matter how well the trail is constructed.

The SFEIS assumes that user-created trails will become naturally revegetated or actively restored, the latter which is contingent upon uncertain grant funding. The SFEIS states that "*erosion and sediment delivery to the stream channel is mitigated by the design criteria requiring outsloping and hardening approaches to stream crossing, installing rolling dips to disperse water from the trail, by reducing the number of locations where OHVs can cross intermittent and perennial streams, and by reducing the density of trails within the sediment delivery zone (300 feet)*" (SFEIS p. 220). However, Foltz (2006), Meadows et al. (2008) and other authors have demonstrated that while a forest may be able to rehabilitate itself after a few passes by an ATV, multiple passes result in the *permanent* loss of natural rehabilitation ability. Once an OHV trails system is implemented, there will be many miles of new disturbance and impacts to streams and wetlands that may never be mitigated.

The SFEIS also makes the case that "*As the effect of the Travel Management Plan are realized, impacts to Groundwater-Dependent Ecosystems (wetlands) in the form of wetlands, wet meadows, and springs would be reduced even with the designation of the trail network in Alternative 5. Through the implementation of the design criteria, user-created trails across wetlands would be hydrologically stabilized and would naturally revegetate over time, and trails that cross wetlands would have minimal effect*" (SFEIS p. 219). The use of Project Design Criteria and putting puncheon stringers over wetlands to elevate the trails are assumed to resolve the impacts of OHV trails. Rather than choosing to go around these sensitive habitats, the ONF is proposing risky Band-Aids that are assumed to avoid or mitigate the impact.

Switalski and Jones (2008) recommended all OHV trails be required to use Best Management Practices (BMPS). BMPS for OHV trails were that all should be located a minimum distance 300 feet from fish-bearing streams and lakes, 150 feet from permanently flowing non-fish-bearing streams, and 150 feet from ponds, reservoirs, and wetlands greater than one acre – 150 ft.

The SFEIS also incorrectly assumes that with the development of an OHV area, all users will automatically behave themselves and stay on trails. This is refuted by nearby OHV trails systems. For example, on the Crooked River National Grassland (CRNG), where an OHV system has been in place for over 24 years, there are numerous illegal user-created OHV and 4 Wheel drive trails and roads throughout. These have largely not revegetated and have received little and relatively ineffective restoration or rehabilitation for the past 24 years, despite the designation of the CRNG as a motor vehicle use area and the nearby 18 mile Henderson Flat OHV area.

IV. Redband trout is listed as a federal and state sensitive species, is a "management indicator species" (MIS), is at risk in the Crooked River Basin, and will be negatively impacted by the Summit OHV Project. Redband trout populations on the ONF are highly fragmented and appear to be largely declining in abundance on ONF streams. Climate change was not considered as a foreseeable cumulative impact in the effects analysis.

FSM 2672.41 is the Forest Service policy implementing the NFMA and establishes objectives and direction to ensure that actions on National Forest System (NFS) lands do not contribute to trends toward Federal listing or loss of viability of any native or desired non-native species.

Redband trout are on the Region 6 Regional Forester sensitive species list (SFEIS p. 124). They are also a "management indicator species" (MIS) for the ONF by virtue of their being a subspecies of rainbow trout (*Oncorhynchus mykiss*), which is a management indicator species (MIS). They are called MIS because when the LRMP was written, "*a group of wildlife species were identified as Management Indicator Species (MIS). These species were selected because their well-being could be used as an indicator of other species dependent upon similar habitat conditions. Indicator species can be used to assess the impacts of management actions on a wide range of other wildlife with similar habitat requirements*" (SFEIS p. 274). Their designation gave them essentially a "bellwether" status for other aquatic life in the basin.

The SFEIS (p.124) failed to state that redband trout is a MIS because apparently they are unaware that redband trout are a subspecies of rainbow trout (Ashbrook et al. 2009, Rhew 2007; Thurow et al. 2007). Redband trout are the native resident rainbow trout in the Columbia Basin east of the Pacific Northwest's Cascade Crest and are typically referred to as redband trout or inland trout (*O. mykiss gairdneri)*. There were three petitions in the mid-1990s to list redband trout under the Endangered Species Act but with changes in procedures for listing, redband trout were dropped from consideration but are still regarded as a species of concern under the ESA (Rhew 2007). The principal reasons for concern are habitat loss, fragmentation of current habitat, isolation of existing populations, and hybridization with coastal rainbow trout and cutthroat trout. Recently, in 2014, a Conservation Agreement was signed by 6 states, 4 federal agencies (including the US Forest Service), one non-governmental organization and 5 tribal governments (California Department of Fish and Wildlife (CDFW) at al. 2014). The intent of the Conservation Agreement is to protect and conserve native redband trout, reduce potential threats to the species, and potentially preclude future needs for listing under the ESA as threatened or endangered.

While the species as a whole is sensitive, Crooked River redband trout are particularly sensitive to further habitat degradation due to loss of functional habitat throughout much of the Crooked River Basin (Stuart et al. 2007). Because redband trout are extremely depressed or absent in streams on much of the private lands in the Crooked River Basin due to irrigation withdrawal and fragmentation of fish populations by dams and impoundments, the remaining populations on the forest are the last stronghold for the species survival in the basin for native redband trout, despite generally poor to fair habitat conditions. Stuart et al. (2007) found that most Crooked River redband trout populations are highly fragmented, many of which are isolated from each other. Streams with low population abundance, marginal habitat and low exchange of genetic material have a high risk of extinction (Rieman and McIntyre 1993).

With the adoption of the Wild Fish Management Policy by the Oregon Department of Fish and Wildlife (ODFW) in 1992, which was later revised to the Oregon Native Fish Conservation Policy (2002), managers discontinued stocking hatchery fish in Marks Creek in 1992, the last stream that had a hatchery program on the ONF. The new management direction was to emphasize the protection and restoration of redband trout and native fish habitat. Surveys conducted jointly by ODFW and ONF personnel indicated that while redband trout were present in watersheds or areas of watersheds that represented 45% of the Crooked River basin, relatively strong populations were located in only 7% of the basin, primarily in small headwater streams on ONF lands and in short reaches of the mainstem Crooked River below Bowman Dam and above Lake Billy Chinook (Stuart et al. 2007). However, habitat conditions on ONF lands indicated that many streams were in poor condition with high summer water temperatures, suboptimal shading and lack of large wood, due to past and present land management activities.

Stuart et al. (2007) reported that many streams on the ONF had high temperatures. Their data indicated that redband trout are highly susceptible to increasing water temperatures. Figure 11 (from Stuart et al. 2007, Figure 7) demonstrates the swift decline in redband trout abundance as stream temperatures increase, one of the parameters for redband survival and persistence.

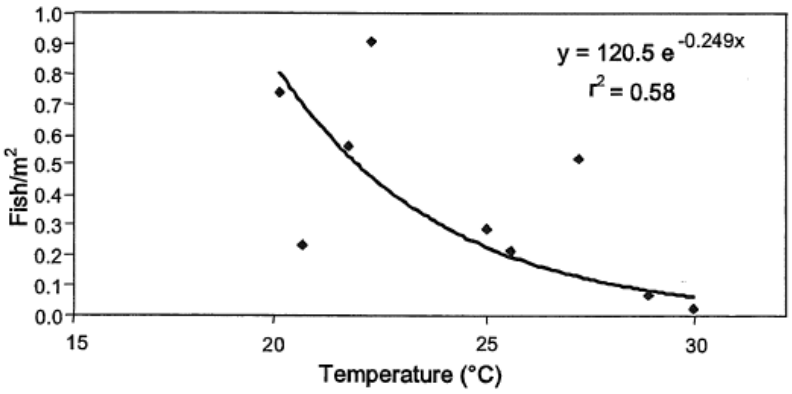


FIGURE 7.—Relationship between density (fish/m^2) of redband trout (all age classes) and maximum water temperatures (°C) in small streams of the Crooked River basin, 1994–1995.

Figure 11. Relative abundance of redband trout declines many fold as stream temperatures increase (from Stuart et al. 2007).

Changes in stream temperatures have been implicated with the construction and maintenance of roads, which by inference includes OHV trails since they have the same mechanism for impacts. Williams (1999) reported that "Roads directly affect natural sediment and hydrologic regimes by altering streamflow, sediment loading, sediment transport and deposition, channel morphology, channel stability, substrate composition, stream temperatures, water quality, and riparian conditions within a watershed" (Lee et al. 1997; referenced in Williams 1999). So, one mechanism to potentially affect temperatures is by interrupting hillslope drainage patterns. By intercepting surface and subsurface flow, and increasing the channels on the landscape, it alters the magnitude of peak flows and lowers base stream discharge (Furniss et al. 1991). Another mechanism that could alter stream temperatures is caused by loss of riparian cover (e.g. for OHV trail clearing across streams and through riparian areas). A third mechanism that has been explored recently is by conversion of groundwater to surface water (Williams 1999). When water is changed from subsurface (e.g. rheic to hyporheic flow) to surface water, as streams degrade, it is exposed to solar insolation (Fissekis and Hersh-Burdick 2007; Wonzell et al. 2009). The hyporheic zone is the area under or beside a stream channel or floodplain that contributes water to the stream, and has been found to have a significant role in the supporting salmonid fish populations. Bowerman et al. (2014) reported that fine sediments reduced percolation of water through salmonid redds (fish nests) and impacted both egg and early life survival. The authors also reported that management actions that restore hydraulic complexity in the form of pool‐riffle sequences, point bars, and large wood enhance hyporheic exchange and support higher salmonid survival. May and Lee (2004) also stated that "increases in coarse sediment supply can be associated with sharp reductions in salmonid habitat and productivity. Land-use practices, such as timber harvest and road construction, are often associated with large influxes of coarse sediment in forested mountain streams. They also reported that streams with discontinuous flow reduced survival by crowding fish into smaller areas with reduced food availability.

Redband trout abundance surveys were conducted on Brush, Porter and Roba creeks, all located in the proposed Project area, and correlated habitat conditions with fish abundance (Dambacher and Jones 2007). Brush Creek with lower water temperatures, low intensity of cattle grazing, and low intensity of timber harvest had the highest fish densities while Porter and Roba creeks successively had lower fish densities that correlated with higher water temperatures, high levels of livestock grazing and moderate to high levels of timber harvest. Although available habitat for redband trout in the three streams differed by no more than a factor of 1.6, there was a 20-fold difference in the density of fish, and age 1+ fish in Brush Creek were significantly higher.

At the Crooked River basin level, the OHV Project could significantly move redband trout towards a loss of population viability and localized extinction. Virtually the entire Project area is in the Crooked River Basin. Fish populations were sampled by ODFW biologists for upper limits distribution in 1990 and 1991 on many ONF streams due to concern for effects of past and proposed timber harvest projects in riparian areas and along Class I and II streams (maps are available at the ODFW Prineville office). At the time, sampling was conducted to discern fish bearing streams that had greater setbacks, aka "buffers" from timber harvest projects. During the course of the redband trout investigations, it was determined that drought conditions from 1991-1994 inevitably led to the

loss of isolated redband trout populations. Some "perennial" streams on the south side of the Maury Mountains of the ONF went dry. Streams such as Double Cabin Creek that formerly had redband populations went extinct.

With physical barriers on private lands below from irrigation dams, these isolated populations on the forest went extinct because was no opportunity for fish to reoccupy these habitats (A. Stuart and S. Thiesfeld, pers. comm.). With climate change trending towards warmer and dryer conditions in the Pacific Northwest, "Summer base flows will be lower, and the network of perennially flowing streams in a drainage system will shrink during the summer dry period, forcing fish into smaller wetted channels and less diverse habitats" (Battin et al. 2007). Bisson (2008) and the Independent Scientific Advisory Board (ISAB) (2007) predicted that "Trout and salmon within the interior Columbia River Basin may be especially sensitive to climate change... Although the intensity of the effects will vary spatially, climate change will alter virtually all streams and rivers in the basin. Current predictions suggest that temperature increases alone will render 2 to 7 percent of headwater trout habitat in the Pacific Northwest unsuitable by 2030, 5 to 20 percent by 2060, and 8 to 33 percent by 2090." Climate change, particularly in the light of already poor stream conditions of high sediment, poor bank stability, low pool frequency and high summer temperatures on ONF lands may cause redband trout to go extinct in the Crooked River basin (USDA 2015d). With highly disconnected habitats between streams, like Double Cabin Creek in the Maury Mountain, there is no opportunity for redband trout to reoccupy habitats once the population has been lost.

Most of the proposed OHV trails will cross highly fragmented and disconnected redband trout populations from Marks Creek on the west end to North Wolf Creek on the east end. Most of the redband trout populations have been disconnected by irrigation dams and diversions on private lands. Even streams that are separated by only a few miles on the landscape such as Crosswhite, Peterson and Porter Creek are completely disconnected and fish cannot move freely between these small populations. The proposed OHV system will further stress these redband trout populations by adding over 100 miles of new trails or reopening of abandoned road beds, which will further change runoff patterns, increase sediment, decrease riparian vegetation, increase water temperature, and compromise the hydrology and stability of the stream systems.

Construction of bridges, culverts, fords and miles of trails both inside and outside of riparian areas will severely impact redband trout throughout the Project area. The cumulative impacts of the extensive road network (open, closed and decommissioned), illegal motorized user trails and livestock grazing already have compromised Deep Creek and its tributaries with high sediment loads, poor riparian conditions and high summer temperatures.

Lee et al. (1998) reported that redband trout were impacted by high road densities. They observed that pool frequency was inversely correlated with road density and land management emphasis. Streams in wilderness and roadless areas generally retained pool habitat in the 50-60 year period from the 1930s to the 1980s and 1990s. They also noted that an important aspect of habitat quality that is fine sediments which were caused by a direct and significant correlation with road densities.

Crooked River redband trout are a subset of the Columbia Basin distinct population segments (DPS) identified (Thurow et al. 2007). Like many of the other DPS, Crooked River redband trout are remnants of what were once larger, more complex, and diverse and connected populations. Redband trout in Crooked River tributaries are in patches scattered in watersheds (Stuart et al. 2007). Most populations are poorly connected and are fragmented by dams, irrigation diversions, temperature and flow barriers, and other migration barriers. Remaining

populations have been progressively isolated into smaller and smaller patches of habitat. Remaining habitat and corridors, such as streams like Deep Creek that have no significant barriers and support redband trout, are critical habitat for migration, rearing, and overwintering and are critical for the conservation of the species.

Further, these remnant populations and habitat are critical for survival of the species in the Crooked River basin with impending climate change. Loss of spatial diversity, population structure, productivity and stability threaten long term persistence of redband trout (Lichatowich and Mobrand 1995; referenced in Thurow et al. 2007). This is particularly true in the Crooked River where few strong populations are left and in highly fragmented habitat.

Deep Creek

A good example of where the OHV trail puts redband trout at risk is Deep Creek and its tributaries located in the heart of the Eastside Implementation Area. It has the largest connected population in the Project area and is the principal tributary of the North Fork Crooked River. Deep Creek itself is one the last best remaining streams with reasonably fair redband habitat on the ONF. Numerous OHV trails are proposed in the Deep Creek watershed throughout the area and that cross Deep, Little Summit, Jackson and Crazy creeks. The SFEIS (p. 137) states that "The Deep Creek watershed represents one of the most interconnected habitats for trout…Deep Creek and its tributaries provide some of the premier trout fishing opportunities in the region due to its diverse, relatively intact and abundant cold water…" Yet, the FEIS proposes to put a trail across Deep Creek at an area with relatively good habitat and is one of the locations that is popular for fishing. The OHV system will essentially further degrade habitat conditions for native trout in one of the last best places for trout fishing on the forest.

SFEIS (p. 194) states that "*Some of the perennial streams that have been identified by Forest fish biologists and the Oregon Department of Fish and Wildlife to be critical refuges for redband trout in the Deep Creek Watershed are Deep Creek, Little Summit Creek, Happy Camp Creek and Double Corral Creek. However, many of these systems have been impacted by past management and are not as effective as they once were in sustaining redband trout. ODFW estimates that these systems are occupied at approximately 10% of historic levels. In addition to redband trout, Columbia spotted frogs are present throughout the area*." Yet, most of the watershed is largely in very poor habitat conditions for shade, water temperature, LWM, pool frequency and pool quality (SFEIS p. 173). The OHV trail will increase the total road/trail density to an 5.6 mi/m^{i2} in the Jackson subwatershed, 7.2 mi/mi^2 in the Little Summit watershed, and 5.8 mi/mi^2 in the Lower Deep watershed, generally 2 or more times the Forest standard (SFEIS Table 116, p. 221). Meanwhile fish populations in Deep Creek have plummeted since 1997. All 3 reaches surveyed by ODFW from 1997 to 2012 showed 2 to 5 fold declines in abundance (SFEIS p. 171-172) (Figures 12-14).

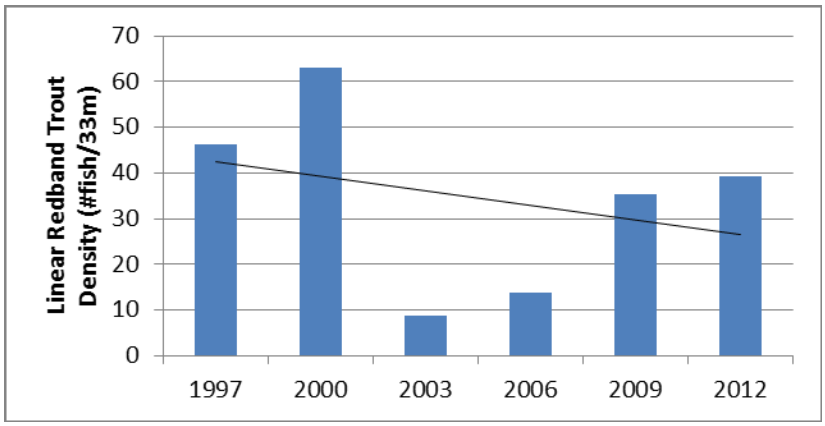


Figure 12. Linear fish densities (fish/33 m) for upper Deep Creek, 1997-2012 in 3 year incremental surveys. From SFEIS Figure 19, SFEIS p. 171.

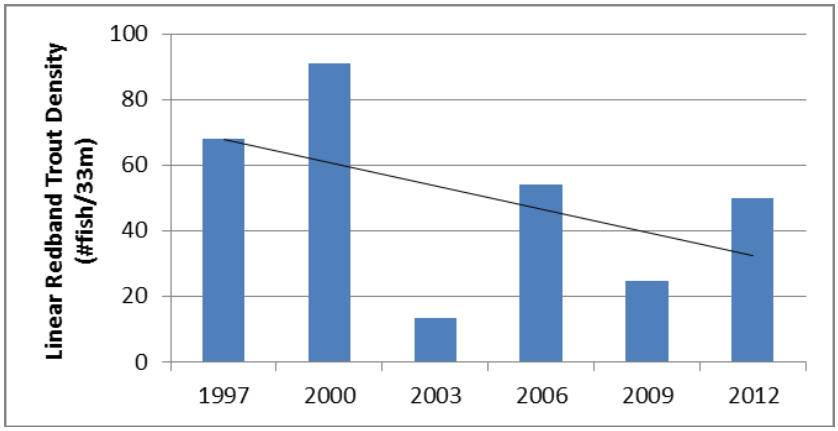


Figure 13. Linear fish densities (fish/33 m) for middle Deep Creek, 1997-2012 in 3 year incremental surveys. From SFEIS Figure 20, SFEIS p. 172.

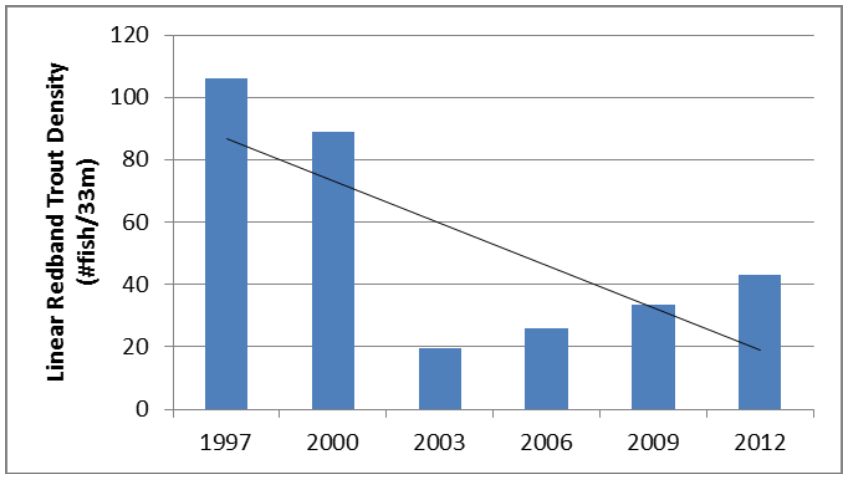


Figure 14. Linear fish densities (fish/33 m) for lower Deep Creek, 1997-2012 in 3 year incremental surveys. From SFEIS

Figure 21, SFEIS p. 172.

The SFEIS (p. 225) states that "*Deep Creek is a focus watershed as defined by the Forest Service Region 6 Aquatic Restoration Strategy*." The 2004 Deep Creek Restoration Plan was to implement 1) Replace 35 culverts and 3 culverts with rock fords to allow passage of flood flows and improve upstream access for redband trout; 2) create 7 water developments, 227 acres of grazing enclosures, 342 acres of riparian pasture, and place large wood along 3.6 miles of stream to better distribute livestock; 3) repair 37 headcut complexes and 18 exposed cutback; close, decommission, and reconstruct 47 miles of roads; and reconstruct 0.25 miles of channel reaches to reduce instream sedimentation; and 4) construct 6 in-stream structures to promote pool habitat for fisheries. In 12 years, the only accomplishments to date are installation of 2 gates, 2.8 miles of road decommissioned in the Lower Deep Creek Subwatershed, and 1.2 miles of road decommissioned in Little Summit Prairie Creek Subwatershed. This is a glacial pace of restoration while fish populations are declining precipitously.

V. The proposed OHV Project impedes meeting the standards for the Ochoco LRMP (FEIS p. 115) and goals and objectives for INFISH (INFISH, Appendix E).

The desired future condition when the LRMP was signed in 1989 was that in "ten years individual watersheds on the Forest that are currently in excellent condition are expected to remain so and those not presently in good condition would be given first priority for improvement. Fifty years and beyond, it is expected that 90 to 95% of the riparian areas on the Forest will be in "excellent condition" by the year 2040" (SFEIS p. 123).

Given that 27 years (54% of the time) has elapsed, and the stated expectations for excellent stream conditions by year 2040 are likely to not be met, the new OHV trail system further will inhibit the ONF from meeting INFISH standards in streams that are largely still in poor condition. Most of the streams in the OHV Summit Project area continue to not meet LRMP standards for an "excellent condition" or INFISH standards for sedimentation, pool frequency, large woody material, and temperature.

ONF goals for water in the LRMP are to "maintain or improve water quality, quantity, and timing of run-off" and to comply with the objectives of the "Clean Water Act" and Oregon State water quality standards" as described in the MOU between the Oregon Department of Environmental Quality (ODEQ) and the Forest Service. The long-term objective was to maintain or improve all riparian areas to "excellent condition." In 1989, it was estimated that approximately ½ of 9,100 of the Forest riparian areas were in excellent condition, although this estimate was largely overestimated and refuted by field sampling (Dambacher and Jones 2007; Stuart et al. 2007). The remaining areas were scheduled for improvement over time. It was intended that a large portion of the needed work to improve streams would occur in the first decade of implementation, although full biological potential could require 20 to 60 years.

Other relevant LRMP standards and guidelines were 1) maintain contacts with Federal, State, and other agencies, groups, and individuals concerned with the management of threatened, endangered, and sensitive species, and 2) consult with the Oregon Department of Fish and Wildlife, Oregon Natural Heritage Data Base and the US Fish and Wildlife Service for technical assistance in developing species management guides and in determining viable

population levels. When suitable habitats or reported locations were suspected to occur in the area of influence of the project, a field reconnaissance would be performed to more precisely verify the presence, abundance, and distribution of the sensitive species.

INFISH (1995) set riparian goals to include: maintain or restore water quality, stream channel integrity and channel processes, and instream flows to support healthy riparian and aquatic habitats. Interim riparian management objectives include bank stability greater than 80%, and interim pool frequency objectives (Appendix E). INFISH stated that "Actions that reduce habitat quality, whether existing conditions are better or worse than objective values, would be inconsistent with the purpose of this interim direction. Without the benchmark provided by measureable RMO [riparian management objectives], habitat suffers a continual erosion" (INFISH Appendix E-3). Standards and guidelines for all Riparian Habitat Conservation Areas (RHCAs) dictate that "where existing roads, facilities, and other improvements found to be causing an unacceptable risk cannot be relocated, eliminated or reconstructed, those improvements would be closed" (INFISH E-6).

The FEIS describes several streams with empirically collected data from the Bottom Line Surveys, Level II and "PIBO" and indicates that many of the streams on the ONF are compromised for sedimentation, habitat and bank stability, and do not meet RHCA objectives. For example, reach 2 of the Elliot Creek subwatershed in the Project Area is described in the 2014 FEIS (p. 132) during the 1996 Bottom Line Survey: "Cattle damage is extreme on the creek. Banks have sloughed off into the channel. Banks are trampled and lack of definition causing heavy sediment to the stream. There is a fence ¼ mile upstream from FR 22 and a cattle crossing that is also causing heavy sediment into the creek due to the heavy cattle traffic through the stream. This area needs restoration to improve fish habitat". Reach 1 is described as "Cattle impact is extreme in this reach… banks are sloughed and trampled, and there is very minimal hardwood such as alders…Overall, this stream offers fish habitat, yet it is in very poor condition due to grazing and past timber harvests." This description was left out of the SFEIS.

Field observations in August 2010 for Elliot Creek on Reach 2, 14 years after the original survey, for Elliot Creek reported virtually the same conditions and no improvement. "Streambanks were impacted by grazing with postholing, hedged alder, and removal of riparian vegetation. The cut streambank appears to be sheered by livestock recognized by their hoof prints. The stream is downcut from loss of vegetation…Sediment deposition on the substrate indicates continuous sediment inputs from cut streambanks" (SFEIS p. 147). Clearly, the stream had not improved from surveys conducted in 1996 to 2010. Adding the impact of the proposed Summit OHV system is inconsistent with the requirement of INFISH of **"Actions that reduce habitat quality, whether existing conditions are better or worse than objective values, would be inconsistent with the purpose of this interim direction"** as the Project will further compromise degraded stream habitat.

Streambank cutbanks are another bank stability parameter that empirically demonstrates poor stream condition on ONF lands. Streams with higher levels of bank instability have higher amounts of fine sediment. The ONF LRMP and Region 6 INFISH standards are for less than 20% cutbank or stream instability. For example, bank stability at Peterson Creek where a Class II trail overlaps the FS 2630 road showed 36% cutbanks.

Turbidity and sediment fines from soil erosion impact water quality and fish habitat. A 20% embeddedness or sediment fines on a substrate is a threshold well established in the literature (Bjornn and Reiser 1991, Rhodes et al. 2000, Rowe et al. 2003). The INFISH standard for channels and sediment is to "maintain or restore the stream

channel integrity, channel processes, and the sediment regime (including the elements of timing, volume and character of sediment input and transport) under which the riparian and aquatic ecosystems developed" and "help achieve rates of surface erosion, bank erosion, and channel migration characteristic of those under which the community developed". Total suspended solids (TSS) and turbidity are key parameters indicative of land disturbance and water quality degradation. ODEQ's standard for total suspended solids or settleable solids (essentially fine sediments) is a narrative and states that the standard is for the stream not to exceed deposits deleterious to fish or aquatic life or injurious to public health. The turbidity standard is also important because fine particles from soils can clog gills of fish, promote excessive algae growth, and reduce dissolved oxygen in waters. Furthermore, it fills in gravel beds and destroys spawning habitat. The ODEQ's antidegradation policy (Oregon Administrative Rule 340-041-0004) is designed to protect water from further degradation from new or increased sources of pollution and protects, maintains, and enhances surface water quality to protect existing beneficial uses.

The following table is taken from data from the SFEIS Hydrology and Aquatics section in Chapter 3 (p. 144-177). The fine sediment data is from the 2014 FEIS as it was not provided in the SDEIS or SFEIS. These two important parameters and ODFW fish sampling data reveal the generally poor habitat conditions and declining fish populations on ONF streams (Table 4). Stream temperature and its effects on redband trout were discussed in the previous section IV. Redband Trout. The temperature data is shown because it is a long term and more rigorous data set and is critical for all life stages of native trout. Sediment data is also included in the table because it is another important parameter that affects salmonids, reflects watershed condition and stream productivity. The high level of embeddedness on many ONF streams impacts native fish and aquatic insects, their important food source. Although the ODFW linear fish sampling data was not as rigorous, it provides a fairly accurate picture about the status and trend of native redband trout in sampled reaches. It is noteworthy that of the 14 sites sampled, only 2 showed an increasing trend, while the others trended downward.

Table 4. Comparison of stream temperature and sediment conditions and redband trout abundance on ONF streams.

Stream Name	Average Temperature Rating	Temperature Trend	Fine Sediment Subwatershed Average	Fine Sediment	Fish Transect Trend # reaches/direction
North Wolf	Poor	No Change 1995-2011	39%	Poor	NA
E Fork N. Wolf	Poor (2013)	NA		Poor	NA
Elliot	Poor	No Change 1996-2008	28%	NA	NA
Fox	Poor	No Change 1994-2002		Fair	NA
W Fork Fox	Poor	NA		NA	NA
Stump and tributaries	Poor	NA		NA	NA
Indian and tributaries	Poor	NA		NA	NA
Howard and tributaries	Poor	No Change 1994-2001		NA	2/Down

Allen and tributaries	Poor	No Change 1994-2013		Fair-Poor	1 Up/1 Down
Peterson	Poor	No Change 1994-2001	45%	Fair	NA
Porter	Poor	No Change 1994-2001	22%	Fair	NA
Jackson	Poor	No Change 1992-2010	21%	Fair-Poor	1/Down
Derr	Poor	No Change 1998-2001		Poor-Fair	NA
Happy Camp	Poor	No Change 1998-2005		Mostly Poor	1/Up
Double Corral	Poor	No change 1992-1994		Fair	2/Down
Little Summit	Poor	No Change 1995-2005		Fair	3/Down
Toggle	Poor	NA		Poor	
Chamberlain	Poor	NA		Poor	
Deep Creek	Poor	No Change 1995-2013		Poor	3/Down
Crazy Creek	Poor	No change 1994-2005	21%	Poor	NA
Crazy tributaries	Poor	No Change 1994-1999		Poor-Fair	NA
Marks	Fair	NA	29%	NA	NA
Crystal	Poor-Fair	No Change 1996-2004	29%	Poor	NA

All of the streams measured were greater than the 20% fines standard, exhibited sedimentation violating Oregon's water quality standards, and are already compromised by past and present land use practices with an extensive road network, timber harvest, and livestock grazing. Again, the proposed OHV Project violates the non-degradation standards of INFISH and State of Oregon water quality standards and its implementation will further compromise streambank stability, fish habitat and native fish populations by subjecting these sensitive areas.

The SFEIS (p. 222-223) does not compare Alternative 5 to the No Action Alternative and irrationally concludes that "*Alternative 5 would have no measurable effect on redband trout and Columbia spotted frog long-term in all project subwatersheds. Short-term sediment inputs from trail construction, especially at stream crossings, may have negative effects during construction when turbidity is high. These negative effects may include fish displacement during times of high turbidity, limited feeding, and possible mortality… From an aquatic species standpoint, Alternative 5 addresses some key hydrologic concerns that were brought up in comments and should, overall, be more beneficial to aquatic species than Alternative 2*."

This summary is specious and misleading. The SFEIS disregards the increased hydrologic connectivity created by many miles of the proposed OHV trail system, disregards that most closed and decommissioned roads are still driven, disregards that the analyses does not account for unauthorized user-created trails, disregards the incredibly high road densities in the numerous subwatersheds, disregards the data that show most of the parameters for INFISH standards such as stream temperature and fine sediments violate standards, and disregards that the majority of fish populations sampled showed declining trends in the past 15-20 years. It is lunacy to use this kind of faulty analyses that lead to erroneous conclusions

VI. The FEIS is inconsistent with the requirements of the Forest Service Manual by proposing an OHV trail that will degrade streams, failing to assist the State of Oregon in meeting conservation goals and failing to avoid or minimize impacts.

This Summit OHV system adds significant stream degradation to streams that are already compromised for high stream temperatures, high sediment loads, low woody material, riparian condition and bank stability and has the potential to lead to local population extinctions and loss of species viability in the Crooked River Basin. The following streams and their numerous tributaries were reported as not meeting one or more stream standards for shade, cutbank, pool frequency, and sediment: North Wolf, Deep, Porter, Peterson, Allen, Howard, Elliot, and Marks creeks. Virtually all of the streams in the proposed OHV area have been affected by past and present land management activities that have degraded stream conditions.

FSM Policy 2670.22 - Sensitive Species objectives requires that the USFS: 1. Develop and implement management practices to ensure that species do not become threatened or endangered because of Forest Service actions, 2. Maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands, and 3. Develop and implement management objectives for populations and/or habitat of sensitive species.

Policy 2670.32 - Sensitive Species requires that the USFS 1. Assist states in achieving their goals for conservation of endemic species… 3. Avoid or minimize impacts to species whose viability has been identified as a concern, 4. Analyze, if impacts cannot be avoided, the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole, and 5. Establish management objectives in cooperation with the states when projects on NFS lands may have a significant effect on sensitive species population numbers or distributions.

The SFEIS proposes to implement the OHV Summit Project and disregarded the results of the Bottom Line, Level and PIBO aquatic surveys conducted that showed streams were already compromised. These included sediment loading, pool frequency, summer stream temperatures, lack of LWM, and bank instability. Somehow, the SFEIS concludes that subwatersheds that violate road/trail density standards and streams that already violate LRMP and INFISH standards will not be furthered impaired by a 137 mile trail system. This view of the world is based on the assertion that 1) grant funding will be used to restore and rehabilitate the numerous user created trails or they will magically heal themselves, 2) all OHV users will magically become responsible, well-behaved users that only drive on the designated trails system, and 3) Project Design Criteria will be the cure all Band-Aids that will mitigate for construction and extensive riding use by upwards of 15,000 riders per year.

The first assertions that user created trails will heal is refuted by Foltz et al. (2009) who found that when abandoned roads were reopened for use, runoff and sedimentation increased dramatically. The authors reported that "Runoff was lowest on the non-track portion of the abandoned road and highest on the reopened road. Sediment concentrations were significantly higher on the reopened road….Thirty years of no traffic and vegetation regrowth was not sufficient to allow recovery of infiltration to values similar to an undisturbed forest." Similarly, Meadows et al. (2008) reported in experiments on 7 national forests that were tested for designated trail, that freshly disturbed soils on ATV trails produce an average of 10 times more sediment than undisturbed soils.

The second assertion is refuted by the section below on law enforcement (see XI. Law Enforcement). Further, two examples demonstrate continuous examples of OHV and off road violations: 1) the ONF closed a majority of the forest to cross country by the 2011 TMP and the 2) CRNG has a designated motorized travel system with an OHV area (Henderson Flat) that closed cross-country travel and limited seasonal in 1992. Pictures of unauthorized roads and trails abound on the forest and provide visual evidence of the difficulty of the ONF to control illegal use. The following is a picture of a road that doesn't exist on the CRNG but is clearly being used by vehicles (Figure 15). Figure 16 is a picture of the same area and shows some rocks recently were added at the bottom to block vehicles from using this unauthorized trail, but appear to be largely ineffective.

Figure 15. An unauthorized road on the CRNG, which has had a "wheeled motorized restriction area" in place since the early 1990s. Photo taken in April, 2014.

Figure 16. Both roads beyond the gate are unauthorized roads. Road on the right with boulders is the same road as in Figure 18. Note rocks at bottom to "deter" use on the illegal road on the right, although no rocks are blocking the illegal road on the left. Photo taken October, 2016.

The 2005 Travel Management Rule requires that the Forest Service consider in designating NFS trails and areas on NFS lands, the responsible official shall consider effects on the following, with the objective of minimizing:

> (1) Damage to soil, watershed, vegetation, and other forest resources" (36 CFR 212.55(b)(2)).

As part of the SFEIS analysis, all action alternatives increase impacts to the hydrologic network, soils, riparian and upland vegetation communities, stream habitat and fish populations. The SFEIS gave very marginal consideration to the major alteration of the hydrology of the landscape and adding further impacts to streams already compromised that largely fail to meet criteria for good or excellent condition. The SFEIS proposes to reopen approximately 50 miles of closed or decommissioned roads and construct somewhere between 51 and 58 miles of new trails (it varies depending on which page of the SFEIS one is reading), which further exacerbates fragmentation. The proposed Project is still proposing to add essentially over 100 miles of new disturbance that will add substantially to the road network, and cause all the same impacts that roads cause. This is not an insignificant impact to hydrology, streams and fish, sediment load and fish habitat.

In addition, while the USFS informed ODFW and Oregon Department of Environmental Quality and invited comments, agency goals and standards were disregarded. ODFW recommended the Alternative 1. No Action due to the concern of a variety of impacts that would affect important fish and wildlife species and their habitats, necessary to meet their *management objectives*. ODFW's information was largely disregarded other than to move a few proposed trails out of RHCAs in Alternative 5.

In essence, the FEIS disregards the standards and guidelines for the FSM and state of Oregon standards for fish, wildlife and water quality protection, and proposes to overlay an OHV system on aquatic habitats that have already been degraded.

VII. <u>The FEIS arbitrarily sets stream crossing densities in riparian, wetland, seeps and springs, and wet meadows with ratings of "low", "moderate" or "high". The FEIS marginalizes the impacts of the OHV area by defining the foot print of disturbance as only the trails while the magnitude is much larger in its effects on natural resources.</u>

The ONF developed a parameter called "stream crossing density" to describe potential effects of the number of times a stream was crossed by a road or trail with the general thought that the more a stream is crossed, the more sediment is put into the stream. The SFEIS states (p. 139) that "*Stream crossings (mainly culverts) can cause a large amount of sediment to be mobilized when hydrologic capacity is exceeded, or when the culvert becomes plugged and the road fills are overtopped. When road fills are breached, sediment loading can greatly increase. Interception of interflow by cut slopes can generate substantial amounts of runoff converting subsurface flow into surface flows (Furniss et al. 2000*)."

Then, the SFEIS set subjective ratings for subwatersheds based on the overall ranges observed in the Project area with more than 3.5 crossings per square mile of drainage area were considered "high", between 2.5 and 3.5 crossings per square mile were considered "moderate", and less than 2.5 crossings per square miles were considered "low". These ratings seem arbitrary and not based on any other logic other than the observed range, probably in GIS.

In addition, the SFEIS (p. 139) reported that "*A road/trail density rating with less than one mile per square mile was considered low, between 1 and 2.4 miles per square mile was considered moderate, and greater than 2.4 miles per square mile was considered high*" and used ML 1-5 roads (but failed to include temporary, decommissioned and user-created trails). These ratings were based on a USFS Watershed Condition Classification Guide and seem rational. However, decommissioned roads, temporary roads and user-created trails that add to stream degradation were arbitrarily and inappropriately left out of analyses for important impacts because these roads and trails are driven by forest users.

By designating such a large Project area and spreading out the number of trails over the landscape, the SFEIS draws the conclusion that the impacts on natural resources will be minor. All the analyses of impacts on soils, hydrology, sediment, fish and wildlife habitats are marginalized by the claim that the Project affects a relatively small footprint on the landscape (an estimated 200 acres of actual trail on a large Project area (301,580 acres). A good example is the analysis of impacted riparian habitat. The SFEIS (Table 160, p. 367) shows that Alternative 5 while only 4.76 miles of new trail and trails on reopened roads will occur in riparian habitats, with only 1 10 foot assumption on the width of the trail, the estimated area impacted will be 5.72 acres. There will be additional impacts from stream crossings as well. The SFEIS (p. 366) states that "*These acreages are small when put in context of the overall amount of land in the project area due to the linear nature of trails. This is especially true considering the vast amount of the planning area where no trails are proposed - the southern half of the project area*."

The arbitrarily small impact zone is based on the fact that the Forest ID Team was told to assume all riders will stay on the designated trail and to base the analysis of project effects to the narrow linear trail feature (Barb Franano, retired Ochoco Forest Fish Biologist, pers. comm.). OHV monitoring results, OHV videos on the internet and first-hand experience show that OHV riders prefer to ride off-trail (See XI. Law Enforcement section). Given

the sensitivity and scarcity of riparian and wetlands habitats and given that a percentage of riders will "play" off trail, even if it's a few riders, many acres of these sensitive habitats will be destroyed.

This is a case of "mission creep". A major change slowly occurs over a long period of time but is accepted as the norm because it happens slowly in small and unnoticed increments. Visitors and forest staff alike slowly adjust to the gradual decline of fish and wildlife populations and sensitive habitats as road densities slowly increase over time. Rather than moving toward the LRMP and Roads Analysis standards, there is gradual acceptance, that the situation normal.

VIII. The ONF failed to share important data on location of trails through sensitive habitats and failed to meet criteria to minimize impacts to riparian areas and aquatic resources.

Central Oregon Landwatch requested through the Freedom of Information Act (FOIA) the GIS data layers for the Summit Trail Project. Most of the base layers were not provided timely such as GIS information requested on all of the fuels and vegetation treatment projects and associated information vegetation treatments and roads for each project such as temporary roads, new construction and reconstruction, and user-created OHV trails. In a few cases, we some of the treatment areas were received but only the areas that had been treated to date, not the entire proposed project treatments that have yet to be completed. For example, for the HEJ project, we received polygons representing the outline of activity units but not the data specific to the project treatments. For trails we received one endurance trail (horse) in the NW corner of the project area, but no data on user-created trails. We did not receive any data for Alternative 1 which is the No Action Alternative and the basis for comparing action alternatives. We are unsure why this data was not provided for all public users to view in the SFEIS as this is important to understand the details and impacts to natural resources for each trail location. Without the site-specific data and analysis, we have no understanding of the existing condition and how trails will impact resources such as Class I-IV streams, riparian habitats, wetlands, seeps, and springs.

One of the bits of information that was received was the location of the Alternative 5 trails with respect to streams, topography and type of trail (new, mixed use open and roads proposed for reopening from decommissioned and closed) in the Deep Creek watershed. Figure 20 shows an area west of Little Summit Prairie on the Eastside Implementation Area and with proposed crossings for Deep and Little Summit creeks.

While there are a lot of problems with this trail, two items are particularly noteworthy from Figure 17. First is the trail north of Deep Creek that is proposed on an old road bed that travels a mile up a Class IV stream before reaching the top of the ridge on the scablands. The second is the amount of new OHV trail construction north of Little Summit Creek on scablands. Figure 18 is the Deep Creek area photo from Google Earth and depicts the Class IV stream where the proposed trail will be located on an old road bed. Measurements indicate that the old road bed is located from approximately 30 to 150 feet from the Class IV stream, well within a sediment delivery zone.

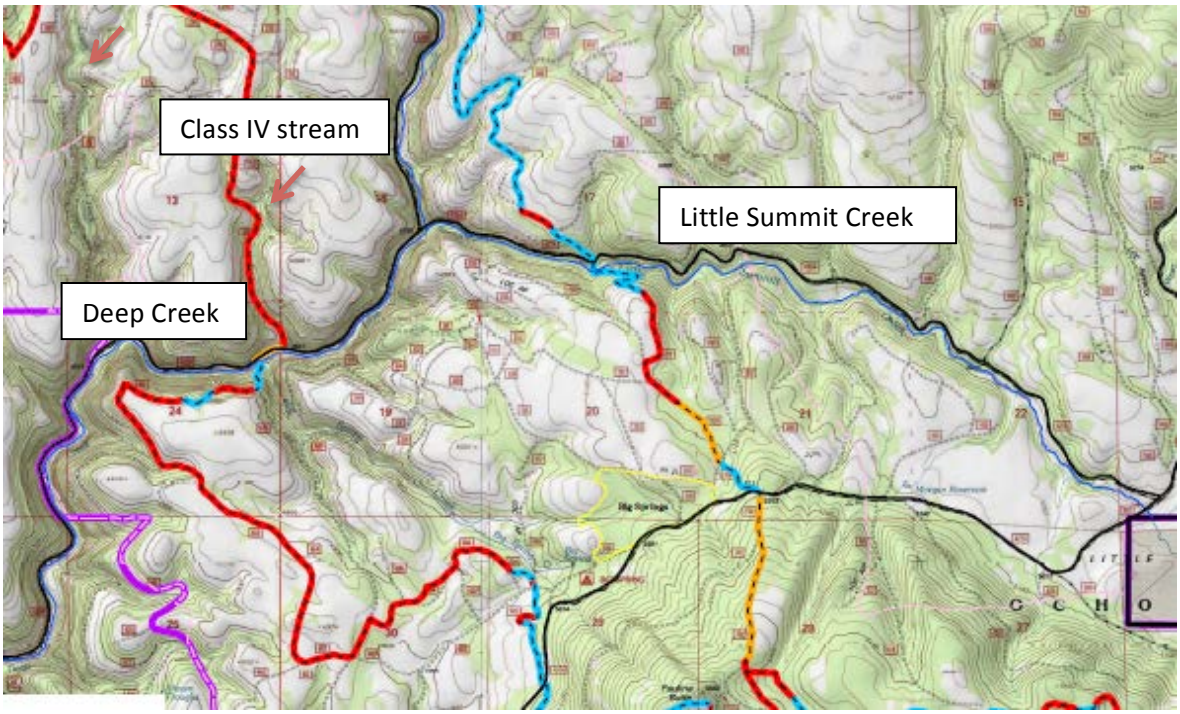


Figure 17. Proposed OHV trails west of Little Summit Prairie and crossing Deep and Little Summit creeks. Note the trail to the right of the "Deep Creek" text box in red, which an old roadbed that is either closed or decommissioned and will be converted to an OHV trail. Note the new construction trail colored in blue north of Little Summit Creek. Orange are "open" roads that are mixed use for both OHVS and highway-legal vehicles.

Figure 18. Google Earth photo with Deep and Little Summit Creeks. The proposed OHV trail will be located in the Class IV drainage in the upper center portion of the photo.

Per Executive Orders 11644 and 11989 in designating NFS trails and areas on NFS, the responsible official (ONF – Forest Supervisor) shall consider effects on the following, with the objective of minimizing:

1. Damage of soil, watershed, vegetation, and other forest resources;
2. Harassment of wildlife and significant disruption of wildlife habitats;

Therefore, these Executive Orders guide the US Forest Service to apply minimization criteria in a meaningful way to each trail segment and minimize impacts to sensitive soils, vegetation and aquatic habitats. While most of the information is presented in such a broad way that it's difficult to see actual site impacts, Figures 17and 18 reveal the lack of minimization criteria that the ONF used to place these trail segments.

The ONF proposes to reopen an abandoned road that has trees growing on the old road bed and convert it to a trail, and the abandoned road is located immediately adjacent to a Class IV stream. So there are combined impacts of crossing a Class I fish-bearing stream (Deep Creek) and then have a trail that is easily less than 50 to 100 feet from a Class IV stream for approximately 1 mile. This is a high risk scenario that will put sediment into the Class IV stream and then down into Deep Creek.

In the second case, most of the trail is new construction up a steep grade to a scabland on top (Figure 17). Despite the comments from the SFEIS that states (p. 440) "*The proposed amendments [for scablands] are site-specific and apply only to proposed segments of connecter trail, most of which are located on existing disturbance*", this trail highlighted in blue is obviously new construction on a large scabland area. The LRMP reports that "Scablands are recognized as among the most fragile ecosystems on the Ochoco National Forest. Damage to the soil and vegetation as a result of management activities is nearly impossible to mitigate. This is a result of their having very shallow soils which are subject to severe water saturation and frost heaving during winter, thus making revegetation virtually impossible." (LRMP 4-197). Scablands have highly erodible soils and the likelihood of sediment reaching streams from these sensitive shallow soils from OHV trails is very high. The SFEIS (p. 376) also noted that "*A project design criteria was developed to protect TES plant habitat by closing the trail system when adverse conditions exist that may result in resource damage (rutting, runoff, etc.), however, in scabland habitat, once the damage is done, it is permanent*". This scenario is another high risk scenario to both the scabland area on the ridge and the high likelihood for both Deep and Little Summit Creeks to be receive large amounts of highly erodible fine clay sediment from the scablands.

In both examples, the ONF failed to meaningfully apply 36 CFR 212.55 (b) (2) minimization criterion to each trail being considered for designation to reduce the effects of the trail system on riparian areas, stream crossings, scablands and aquatic habitat. We were unable to obtain this type of site-specific data for most of the trail system. While there was limited data provided to Central Oregon Landwatch despite the FOIA request for all the base layers and the proposed trails, it is clearly apparent that the ONF failed to locate OHV trails away from these sensitive habitats and it will result in substantial erosion on the scablands and ridge area, and deposition of fine sediments in two Class I fish-bearing streams. Despite the verbiage in the SFEIS that proposes to use Project Design Criteria for Water Quality and Aquatic Organisms (SFEIS p. 31-33), such as using the least grade for stream approaches, reverse grades, hardening with concrete blocks, these are largely construction Band-Aids. There is a

high risk that the locations of these proposed trails will increase runoff and sedimentation from sensitive scabland soils and cause further impacts to already degraded streams, riparian areas, and aquatic habitats.

IX. The FEIS failed to recognize important collaborative and coordinated planning strategies by ODFW, the USFS, and other organizations to protect much of the proposed OHV area from impacts of development.

Numerous entities including the USFS, ODFW, The Nature Conservancy, American Fisheries Society, the Interior Columbia Basin Ecosystem Management Project, and others designated large areas around the North Fork Crooked River including Big Summit Prairie and the tributaries draining into the prairie, and the entire Deep Creek watershed as critical for protection and conservation. Development and implementation of an OHV trail system in this area is inconsistent with goals to protect and restore this sensitive area.

The proposed Project is inconsistent with the USFS Region 6 Terrestrial Resource and Conservation Strategy Areas (TRACS) which was developed as a framework for the region and forests to identify key habitats and species to conserve, restore and enhance habitats for these landscapes (USFS 2012a). The TRACS theme is "protect the best and restore the rest". The TRACS states in the section on Minimum Roads Analysis that "TRACS should be a primary consideration when completing a Minimum Roads Analysis. Roads are a major threat to priority species and habitats. For example, open roads cause disturbance to 52% of the TRACS Priority Vertebrate Species. Information in the TRACS databases can be used to identify areas that are most important to species and habitats affected by roads, as well as areas where access in important to conduct restoration efforts" (USFS 2012a).

In addition, the priority area that includes the Upper North Fork Crooked River watershed includes the North Fork Crooked River/Big Summit and tributary areas also include an overlapping Aquatic Restoration and Conservation Strategy (ARCS) area (USDA 2008a). The SFEIS failed to acknowledge the importance of redband trout and conserve redband trout as an Oregon Conservation Strategy (OCS) species or the Blue Mountain BM-04 Conservation Opportunity Area as an important strategy habitat to be conserved and protected (ODFW 2006, 2016) (Figures 19-21). Planning and implementation of the Summit OHV Project is inconsistent with protection and restoration of key strategy species and habitats in the North Fork Crooked River and Big Summit areas.

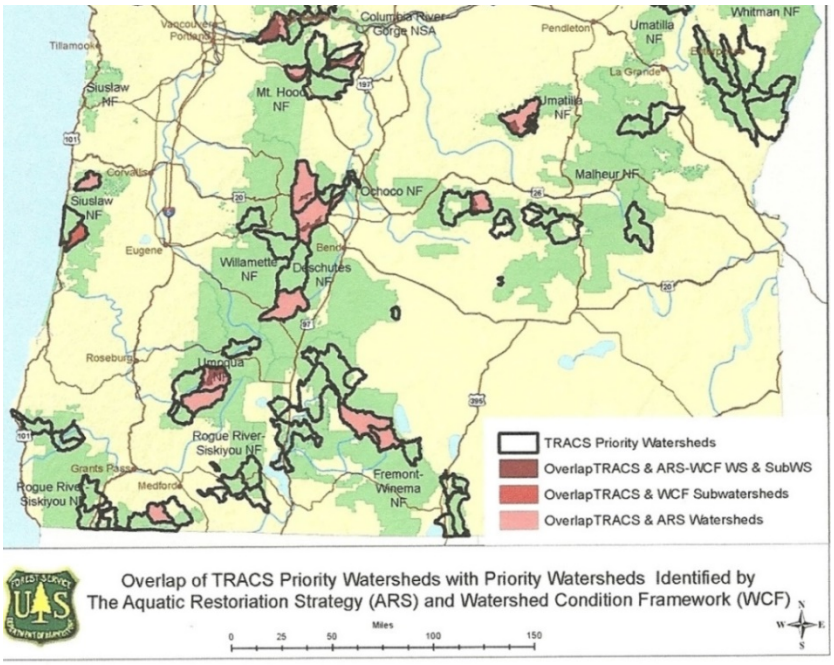


Figure 19. TRACS. Note the overlap of the ARS and WCF with TRACS identifying the Big Summit Prairie and North Fork Crooked River tributaries including the Deep watershed as a priority area for conservation.

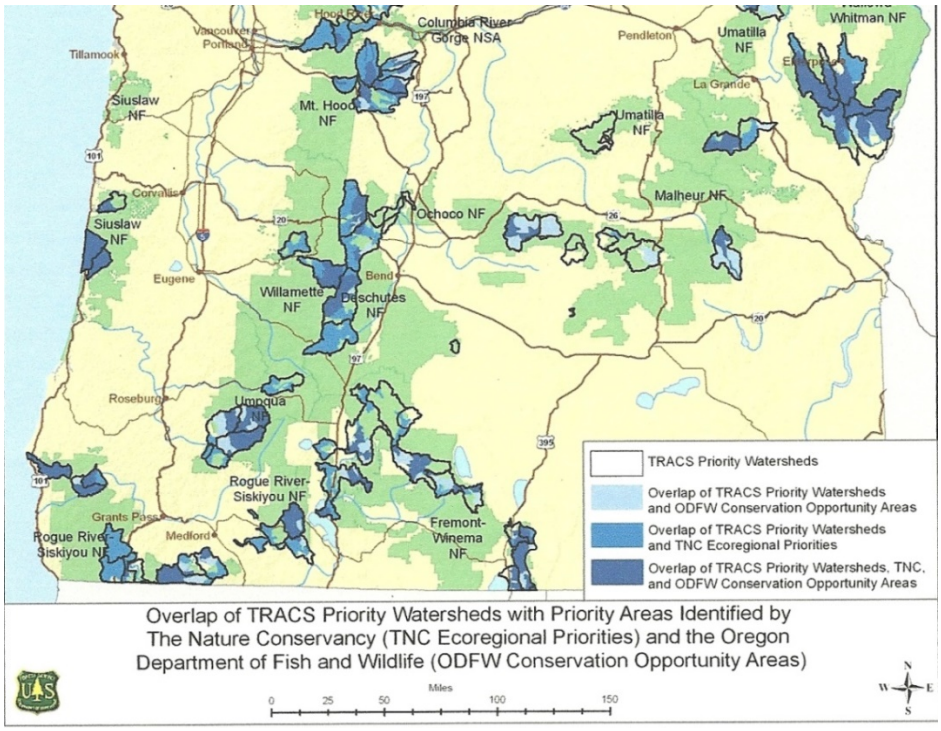


Figure 20. TRACS priority watersheds. Note the overlay with the ODFW Conservation Opportunity Area and TNC Ecoregion Priorities.

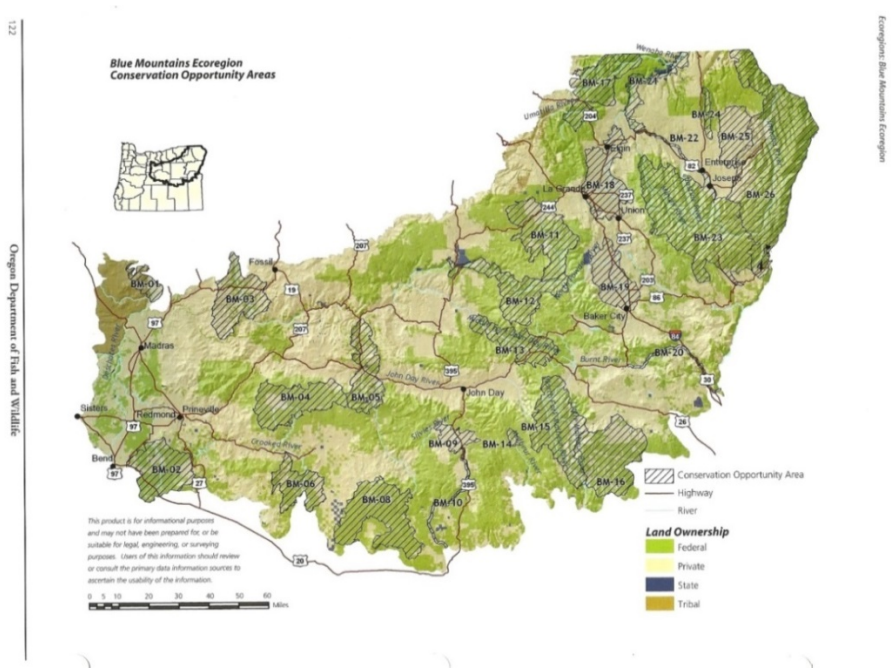


Figure 21. The ODFW OCS Blue Mountain-04 Strategy Area covers large areas and tributaries of the Big Summit Prairie and the North Fork Crooked River tributaries, essentially much of the east and west proposed OHV areas.

The Oregon Conservation Strategy (OCS) is ODFW's equivalent of the TRACS and is an overarching conceptual framework for long term conservation of fish and wildlife and their habitats using the best available science. Proactive conservation and restoration supports healthy populations of fish and wildlife and avoids costly and controversial regulations that accompany federal listing of species under ESA. USFS staff participated on the Technical Advisory Committee and reviewed the strategy as it went through development and a public review process. One action specifically listed in the OCS is to "work cooperatively with land managers and off-highway vehicle groups to direct use to maintained trails and to improve enforcement of existing off-highway vehicle rules" (ODFW 2006, 2016). ODFW recommended comments to the DEIS (2013), FEIS (2014), and SDEIS (2016) that the USFS abandon this OHV Project, and their comments were largely ignored.

In the Blue Mountains Ecoregion, riparian areas are a strategy habitat for a high level of protection while Inland Columbia Basin redband trout are a strategy species. Increasing recreational pressure and invasive species are major impacts. Even more specifically, OHVs are singled out as a factor causing impacts to riparian, aquatic, and other sensitive habitats, a source for spread of invasive plants, increased fire danger and impacts to wildlife behavior and distribution especially during critical breeding and wintering periods. Use of forest roads also affects wildlife behavior and distribution depending on road type and traffic levels (ODFW 2006, 2016).

BM-04 Ochoco Mountains is a Conservation Opportunity Area in the OCS emphasized for protection and restoration. It includes the parts of the North Fork Crooked River designated as a Wild and Scenic River, the Big Summit Prairie, one of the largest montane wetlands in eastern Oregon, streams throughout the area provide habitat for inland Columbia Basin redband trout and an area with a high potential for breeding sandhill cranes. Key habitats include aquatic, wetlands and wet meadows and key species include Columbia Basin redband trout and sandhill crane. This same area is also recommended for protection in the American Fisheries Society Aquatic

Diversity Areas, the Eastern Oregon Bird Conservation Plan, and the Interior Columbia Basin Ecosystem Management Project plant biodiversity area.

Numerous entities including the USFS, ODFW, The Nature Conservancy, American Fisheries Society, the Interior Columbia Basin Ecosystem Management Project, and others have designated large areas around the North Fork Crooked River including Big Summit Prairie and the tributaries draining into the prairie, and the entire Deep Creek watershed as critical for protection and conservation. Development and implementation of an OHV trail system in this area is inconsistent with goals to protect and restore this sensitive area.

X. The proposed mitigation measures are contradictory and insufficient to mitigate for impacts caused by the Summit OHV system on soils and stream sedimentation.

The SFEIS (p. 31-33) proposes "Resource Protection Measures" (SFEIS, p. 29) and then cites "Project Design Criteria" (DPC) for action alternatives that are intended as "*sideboards and assumptions that were used in development of specific alternatives*" (SFEIS p. 29). The water quality and aquatic life PDCs on pages 31-33 are supposed to avoid, minimize or mitigate the Project but many of these are largely ineffective. The SFEIS (SFEIS p. 33) estimates that "*Annual precipitation ranges from 15 to 31 inches per year*", which at the higher elevations in the Project area, would average around 30 inches. The SFEIS further describes the climate with respect to vegetation and sediment delivery to streams (SFEIS p. 33) "*Semi-arid climates, such as the climate found in Central Oregon, are expected to be elevated relative to other climates as a results of these climates having sufficient precipitation to drive erosion, but limited amounts of vegetation that stabilize hillslopes from erosion (Goode et al. 2012). Generally, vegetated filter strips between 200 to 300 feet from the stream are considered to be effective in controlling sediment that is not channelized depending upon the riparian buffer slope (Belt et al. 1992).*"

One problem is the season of use (SFEIS Table 27, p. 72). Alternative 5 has a 4 month operating season proposed from June 1 to September 30, however, much of the trails are in high elevations and both construction activities and OHV riders are likely to encounter wet soils particularly in June when snow is receding and rainfall is more frequent. May and June are when redband trout are spawning and young of the year are rearing in headwater tributaries from early July to mid-August (Stuart et al. 2007).

Most of the DPCs are largely construction measures but don't mitigate for the ongoing and continuous loss of vegetation and soil disturbance, and soil ruts, and subsequent sediment into streams every time it rains or snowmelt occurs. In fact, it's hard to determine what structures will be implemented let alone whether they are effective at reducing sediment into streams at crossings. The SFEIS has a confusing mixture of bridges, culverts and fords that vary depending on the location of the information. For example, the total numbers of crossing types are either 79 or 96 (SFEIS p. xiv, p. 107). Data on the types of stream crossings are with a total of 9 bridges, 39 culverts, 7 puncheon stringers, and 24 fords in Table 26 (SFEIS p. 71), a total of 23 bridges, 73 culverts, and no fords and puncheon stringer in Table 53 (SFEIS p.107). There are more inconsistencies so which is it? This conflicting data shows how the ONF cannot possibly even begin to minimize OHV trail impacts to aquatic resources when they have not completed field surveys and don't even know what's on the ground. It leads to confusion and makes comparison of alternatives difficult, and calls into question the accuracy of all data presented throughout the SFEIS. Regardless of the conflicting information, merely adding a bridge or culvert on

most of the stream crossings does not alleviate impacts from 1) hardened fords, 2) a largely expanded network of roads and new trails within 300 feet of streams, and 3) crossings on ephemeral streams.

The FEIS proposes puncheon stringers for wet meadows, hardening stream approaches, crossing drainage structures, and water drainage facilities (SFEIS p. 32) for all trails. These mitigation measures are also insufficient to impact streams already compromised by past and present land use practices. When OHVs ford streams, they release sediment into streams ((Switalski and Jones 2012) by other mechanisms: 1)surface runoff concentration from wheel ruts, 2) exposed soil surfaces from tracks, 3) increased runoff from soil compaction, 4)vehicle backwash, and 5) undercutting of banks from waves (Switalski and Jones 2012). While the proposed culverts may alleviate impacts from items 4 and 5 above, they cannot alleviate sediment sources from the first 3 mechanisms.

The SFEIS also alleges that "*physical closure would offset the development of new designated trails by physically limiting unauthorized access on these routes*" (FEIS p. 343). There are many areas such as scablands that are large and relatively flat and easily accessible to almost any motorized vehicle. It is specious to assert that physical closures could possibly limit off road use, since it is already occurring on many "closed" areas that are physically blocked with a gate, large rocks, or ripping. The following is a photo on a scabland where the proposed OHV area will be on the dirt road straight ahead while the road on the left will remain "closed" (Figure 22).

Figure 22. Scablands with "closed" roads. Road straight ahead is proposed as part of the Summit OHV system while the road to the left will remain "closed" and according to FEIS p. 343, "physically closed".

XI. The FEIS fails to address the impacts of illegal OHV use. With one law enforcement officer (LEO), adding an additional OHV area substantially reduces the effectiveness of law enforcement on the landscape. Grant or "soft" dollars are inappropriately relied on to fund restoration and mitigation requirements.

The SFEIS fails to adequately assess the impacts of the proposed OHV system and fails to assess impacts of resulting illegal use. The SFEIS did not include many of the closed and decommissioned roads and user created trails in the analysis on impacts to hydrology, streams and sediment. With an estimated 700 additional miles or more of known unauthorized user-created trails, the SFEIS failed to disclose the harm occurring to soils and streams. Meadows et al (2008) reported that increased use of ATVs on public lands means that even a small percentage of riders who travel off roads/trails cause considerable damage, and because the motorized vehicles are powerful, can travel many miles quickly and damage sensitive resources easily.

One compelling example is Henderson Flat, an OHV area on the CRNG, administered by the ONF and which has been in place for over 20 years. The CRNG has numerous illegal roads and trails, most of which have been created in the past 20 years. Because much of the Grassland is relatively flat with easily accessible grades, vehicles continue to drive off road causing much damage to natural resources (Figures 23-29).

Figure 23. Motorized Restrictions on the Grassland

Figure 24. Posted regulations on the Grassland.

Figure 25. "Closed" OHV road; note the broken sign

Figure 26. Illegal OHV trails in Skull Hollow

Figure 27. Illegal 4WD road

Figure 28. Illegal motorcycle trail

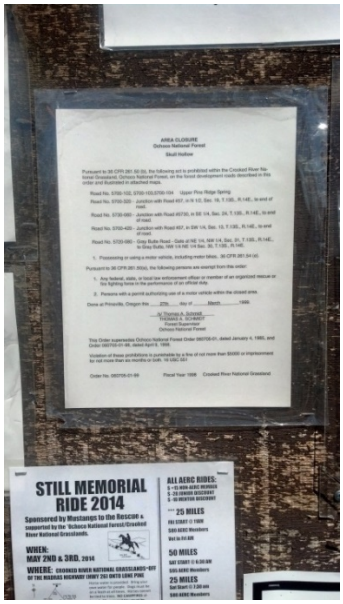


Figure 29. Road closure sign

Figures 23-29 through depict the problem of ongoing illegal use on a restricted motorized area that has been in place since the early 1990s. The SFEIS argues that the Summit OHV Project would better distribute OHV use but in fact, these illegal roads and trails have never been restored or ineffectively at best, are rarely if ever enforced, and continue to degrade water quality, increase sedimentation, and impact important year-round and big game winter range for mule deer and antelope. A likelier scenario is that the proposed Summit OHV trail would create even more illegal activity and access to more areas, creating more damage to sensitive habitats and fish and wildlife resources.

The addition of a new OHV Project would take the already limited law enforcement (one law enforcement for the approximately 1 million acres of ONF and CRNG) and direct it at these new trails, further shifting resources away from the illegal trails, rampant throughout the CRNG and Forest.

The following is a summary of observations of off-trail and off-road use from other locations around western states:

- A Utah report reveals that a high percentage of riders prefer to ride “off established trails” and did so on their last outing. 49.4% of ATV riders surveyed prefer to ride off established trails. 39% rode off trail on their most recent trip. 38.1% of motorized dirt bike riders prefer to ride off established trails. 50% rode off established trails on their most recent trip (Fisher et al. 2002).

- More than nine out of ten (91%) of respondent rangers from the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) agree that off road vehicles represent "a significant law enforcement problem" in their jurisdictions (Rangers for Responsible Recreation 2007).

- According to one BLM respondent, "90% of ORV users cause damage every day they ride. Most will violate a rule, regulation or law daily.” (Rangers for Responsible Recreation 2007)

- A 2006, Montana Fish, Wildlife and Parks study of OHV users surveyed 446 owners of registered off-road vehicles. 23% of respondents said that they “always or sometimes” ride cross-country even though off-route riding is against the rules in Montana and has been since 2001. Over 28% “sometimes or never” avoid riparian areas and wetlands, in violation of rules for federal and state public lands in Montana. 64% have used an off-road vehicle while hunting and the majority of this hunting subset admits to riding cross-country. Over 58% traveled off legal routes to retrieve downed game. (Lewis and Paige 2006).

- A Colorado study found that the majority of off-roaders understand that staying on designated routes is “fundamental trail etiquette” and that going off trail is not “correct” off-road vehicle behavior. The survey revealed, however, that regardless of this knowledge “as many as two-thirds of adult users go off the trail occasionally.” 15-20% of the riders admitted to frequently breaking the rules and riding off of legal routes often. Participants also stated that “others” ride off-route and cause most of the damage (Frueh et. al. 2001; referenced in Kiely and Kassar 2007).

Kiely and Kassar (2007) assessed attitudes and behaviors of OHV drivers. The fairytale assumption is that a well-designed trail will keep riders on OHV systems when riders are provided a well-maintained designated trail system (SFEIS p. 80). Kiely and Kassar (2007) discredited this with a review of studies and demonstrated that OHV riders have a distinct predilection to travel cross-country and ride off of legal routes. They also reported that public land managers tend to assume that designating additional OHV trails and roads leads to improved compliance with regulations, reduced illegal riding, and, therefore, less resource damage and fewer conflicts with non-motorized

users. They stated that some public land managers believe that OHV users will not create illegal routes once more trails and routes are designated "open" and OHV users are educated to proper OHV etiquette. Their research demonstrated that damage and conflicts are not just caused by a small percentage of OHV riders that law enforcement was essential to manage lawless behavior, and education and information needed to be accompanied by strong law enforcement to change off-road behavior.

In central Oregon, there are almost 1,000 miles signed routes that OHV users may choose to use. The proposed Summit OHV area is estimated to have 700 miles of illegal user created trails. However, there is no assurance that federal agencies will provide sufficient on-the-ground enforcement to keep OHVs on designated routes. It hasn't happened yet, so why give credence to empty promises? Given the preference of OHV users for going off trail, enforcing existing designated trail systems are already an enormous challenge for law enforcement, let alone adding a new system in the Ochoco Mountains for the sole law enforcement officer.

The TMR indirectly addresses enforcement, by stating that "In designating NFS roads, NFS trails, and areas on NFS lands for motor vehicle use, the responsible official shall consider effects on NFS natural and cultural resources, public safety, provision of recreational opportunities, access needs, conflicts among uses of NFS lands, the need for maintenance and administration of roads, trails, and areas that would arise if the uses under consideration are designated; and the availability of resources for that maintenance and administration." While the SFEIS reports that COHVOPS will be the entity that is responsible for maintenance and enforcement, it has largely been ineffective in places like the CRNG near Henderson Flat OHV area. Three years ago at a 2013 OPRD ATV Grants Committee meeting, it was reported that COHVOPS already has a total of 1,121 miles to patrol, operate and maintain. More OHV areas have come online or been expanded since then including the Three Trails Area on the Deschutes National Forest and Cline Buttes on the BLM lands west of Redmond.

The SFEIS commits to funding the OHV Project, which includes road closures and restoration along with construction, operation, and law enforcement, using "soft dollars" from grant sources. Most of the proposed funding for the OHV Project is from COHVOPS competing for state ATV grant funds from the Oregon Parks and Recreation Department. The 2014 FEIS admitted (p. 498) that "*Competition for state ATV grant funds is challenging"…."It is possible the State could divert gasoline tax revenue (which composes the bulk of the ATV grant funds) towards other uses*". With a history of declining federal dollars, the USFS has a long history of building and not maintaining facilities.

The ATV Grants Committee reported funding shortfalls for OHV Project requests starting in 2011 (April 2011 Meeting) and declined to fund the request from the ONF for the Summit Planning Grant for $36,500.00. Table 5 shows the general declining support for law enforcement for OHV trail systems while COHVOPS has experienced some grant fund fluctuations for operations, maintenance and compliance in the 3 recent bienniums.

Table 5. Grant funds from the ATV Committee to Central Oregon from the 2011-13 biennium to 2015-17 biennium.

Entity/Biennium	Crook County Sheriff	BLM Law Enforcement	COHVOPS O&M
2011-13	$145,890	$161,104	$936,298

2013-15	$96,433	$122,536	$880,414
2015-17	$50,050	$0	$1,035, 781

Declining funds for recreation facilities and roads and increasing costs for wildfires mean less funds for managing a proposed OHV trail system. The 2006 ONF Recreation Facility Analysis projected a decline in funds to maintain recreation sites on forest (USDA 2006). The same decline in funding for transportation was reported in the 2015 Forest Wide Transportation Analysis Report (USDA 2015b). The SFEIS (p. 57) stated that "*It would also be anticipated, however, that the selection and implementation of an action alternative in this analysis would result in an increase in recreational traffic during the summer months, as a result of increased OHV use*." The 2015 Forest-Wide Travel Analysis Report (TAR) (USDA 2015c) indicated that "*Forest Service road budgets have been steadily declining for the past 20 plus years. Region-wide, the amount of funding for road work including both appropriated funding and work contributed by commercial users is less than 20 percent of what it was 20 years ago. Appropriated road funds to the Pacific Northwest Region (Region 6) have been reduced 40% in the past 5 years alone*" (TAR, USDA 2015c). With the projected decline in funds, maintenance has been deferred for much of the forest roads. Meanwhile, wildfires have taken a steadily increasing portion of Forest Service funding (USDA 2015a). In 1995, fire made up 16 percent of the Forest Service's annual appropriated budget, made up over 50% in 2015, and is projected to reach 67% by 2025.

Adding the OHV system to a transportation and recreation that is already overcommitted and underfunded, and relying on soft grant dollars for mitigation and restoration violates the 2011 Council of Environmental Quality (CEQ) guidance for monitoring and mitigation (CEQ 2011). The regulation states that "agencies should not commit to mitigation measures considered in an EIS or EA absent the authority or expectation of resources". The CEQ guidance states that "if it is reasonably foreseeable that funding for implementation of mitigation may be unavailable at any time during the life of the project, the agency should disclose in the EA or EIS the possible lack of funding and assess the resultant environmental effects". This guidance states that if mitigation such as closing roads cannot be done because of lack of funding, then the FEIS must disclose the environmental consequences. The proposed grant funds are soft dollars and should not be relied upon to implement and therefore the Project should not happen due to the environmental harm it would to do fish and wildlife and their habitat.

XII. The FEIS and associated documents are poorly written, do not summarize the information well and make the public reader search for information.

According to 40 C.F.R. § 1500.2(d), a critical part of the obligation for public review and disclosure is to present the data and analysis that will enable the public to thoroughly review and understand the analysis of environmental consequences. NEPA requires the use of high quality data and the disclosure of the methodology underlying proposed decisions, and also explicitly requires that an EIS "be written in plain language" and presented in a way that "the public can readily understand". The regulation at 40 C.F.R. § 1502.8 states that these requirements are particularly true for an EIS; the "primary purpose" of this document is "to allow for informed public participation and informed decision making" so its language must be "clear" and "supported by evidence that the agency has made the necessary environmental analyses."

A careful review of data, analyses and the conclusions of the FEIS was challenging at best, and misleading or disingenuous at worst. The effects analysis for watersheds and hydrology used data that was in many cases outdated or not well explained. Assumptions were not well documented or highly speculative. There was little if any ground truth surveys. It was difficult to analyze existing conditions since the information was scattered throughout the document. For example, all of the streams should have been summarized in a table to demonstrate the existing condition for important elements such as temperature, bank stability, sediment, and pool frequency. The SFEIS cannot adequately demonstrate analyses unless there is a complete picture of the existing condition. Much of the literature cited in the document was not listed in the Literature Cited section. So once again, the reader had be a detective and look for the documentation on line.

If you have any questions about these comments, please call me.

Sincerely,

/s/ Amy M. Stuart (verifiable signature available upon request)

Amy M. Stuart, Fish Biologist

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PROFESSIONAL EXPERIENCE:

Oregon Department of Fish and Wildlife (ODFW), 9/2007 to 2/2014, Deschutes Watershed Manager

- Supervised 60 professional and technical staff.
- Managed expenditures of a combined budget of $9 million per biennium for 25 cost centers.
- Implemented fish, wildlife, research and habitat program goals, objectives and priorities.

ODFW 7/1997 to 8/2007, Hydro Power Program Biologist, High Desert Region

- Lead for the High Desert Region for re/licensing and compliance for state and federal FERC licensed hydro projects in the Klamath, Deschutes, Hood and Owyhee basins.
- Lead negotiator and/or technical lead for the Pelton Round Butte Settlement Agreement, Klamath Settlement Agreement, and Powerdale hydro project decommissioning.

ODFW, 1/1990 to 6/997, District Fish Biologist (DB), Supervisory FWB (3 1/2 years) and NRS 3 (4 years), Ochoco District, High Desert Region

- Fish program manager for the Ochoco District (7½ years). Hired, supervised, and conducted performance reviews of 1 permanent, several seasonal employees and 3 high school interns.
- Collected and analyzed fish population abundance and distribution, species composition, and harvest; evaluate hatchery stocking, harvest regulations; implement habitat protection/restoration.

ODFW, 2/1988 to 12/1989, Assistant District Fish Biologist II, Ochoco District, High Desert Region

- Implemented the fish management program. Sole fish biologist and assumed lead responsibility; ½ time Ochoco National Forest Fish Biologist: advised fish issues for timber sales and range allotments; conducted fish, habitat surveys and habitat projects. Authored bull trout plan at Lake Billy Chinook.

ODFW, January 1986 to January 1988, Fish Habitat Biologist II, BPA Program, John Day, NE Region

- Implemented habitat program using restoration techniques to improve fish and wildlife habitat: bank stabilization and habitat projects. Implemented contracts and landowner lease agreements. Prepared annual reports. Developed, supervised and administered budgets, personnel, equipment, and ODFW staff.

1977-1986. ODFW Ocean Salmon, US Forest Service, US Army Corps of Engineers, Colorado Mined Land Reclamation, and private timber cruiser.

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Numerous presentations to the Oregon Fish and Wildlife Commission and conservation groups for 20 years on a variety of topics including the Crooked River Basin Fish Management Plan, Annual Fishing Regulations,

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Oct. 31, 2016

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Re: Review of Supplemental Final Environmental Impact Statement (FSEIS) and appendices for the Ochoco Summit Trail System Off Highway Vehicle (OHV) Trail Project (Project) on the Ochoco National Forest (ONF), dated September 2016

Dear Mr. Dewey,

I reviewed the aforementioned FSEIS, including appendices, particularly with respect to its assessment of watershed and aquatic impacts and compliance with the ONF Land and Resource Management Plan (LRMP) standards. These standards include those in the 1995 "Inland Native Strategies for Managing Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana, and Portions of Nevada" (INFISH) amendment to the LRMP. As part of my review, I also reviewed:

- My previous 2014 review and discussion of the numerous inadequacies in the FEIS for the Project, which also describes the material I reviewed at that time;
- The 2016 draft reports on botany, geology, and aquatics for the FSEIS;
- Salient scientific literature, which is listed in the literature cited section at the end of this report.

My comments explain how the FSEIS failed to properly assess the Project's aquatic impacts and compliance with required standards and failed to substantively respond to most of my previous comments on the FEIS's defects.

THE FSEIS FAILS TO PROPERLY DESCRIBE EXISTING CONDITIONS THAT CONTRIBUTE TO CUMULATIVE EFFECTS

The FSEIS failed to disclose the extent of grazing in the Project area at the scale of watersheds and subwatersheds.

Most of the Project area is subject to grazing as the FSEIS acknowledges (p. 388). This is significant because, as discussed in greater detail in following sections, it is well-documented that livestock grazing contributes to the degradation of several stream conditions that are INFISH Riparian Management Objectives (RMOs). The ONF is required to avoid degradation of RMOs and not allow activities to retard their attainment.

Studies have repeatedly documented that grazing contributes increases water temperatures by reducing stream shading and widening streams via trampling and sedimentation (USFS and USBLM, 1997; Cowley, 2002; Beschta et al., 2013; Nusslé et al., 2015). As a USBLM publication (Cowley, 2002) noted:

> "[i]t is well documented that large herbivores such as cattle, horses, sheep, bison, elk, and moose can alter the physical dimensions (e.g., increasing the bankfull width) of stream channels by bank trampling and shearing…Increasing the bankfull width makes the stream shallower, increases sediment, decreases the floodplain, increases temperature, and increases the adverse [effects on] the physical functioning of a stream, its associated riparian area, and aquatic habitat…"

Water temperature is an INFISH RMO. As will be discussed in greater detail, the action alternatives will adversely affect water temperatures in numerous subwatersheds in the Project Area, many of which already have severely degraded water temperatures.[1] Water temperatures are cumulatively affected by watershed scale conditions (Allen and Dietrich, 2005), including those affected by grazing. Thus, grazing and the action alternatives will have combined temperatures impacts that must be assessed in order to:

a) reasonably assess compliance with INFISH RMO for water temperature;
b) adequately determine compliance with the state water temperature standard;
c) properly estimate and make known cumulative effects on water temperature;
d) adequately determine impacts on redband trout which are already adversely affected by degraded water temperatures (McCullough, 1999) due to the combined degradation of streams and riparian systems in the Project area caused by existing roads, grazing, logging, and OHV use.

As discussed in more detail in a following section, the FSEIS failed to reasonably assess these combined impacts on water temperatures. Nonetheless, at a minimum, the FSEIS needed to make known the fraction of Project subwatersheds that are subjected to grazing in order to provide at least some index of water temperature impacts due to grazing combined with trail impacts under the action alternatives.

Stream channel width/depth ratio is another INFISH RMO which is greatly affected by grazing (Rhodes et al., 1994; Magilligan and McDowell, 1997; USFS and USBLM, 1997; Nusslé et al., 2015) and would be significantly affected by the impacts of the action alternatives, although the FSEIS fails to disclose the latter. Grazing not only directly widens channels, but also increases width/depth ratios via greatly accelerated sedimentation, which the action alternatives would also increase. As discussed in more detail in a following section, the FSEIS acknowledges (pp. A-46, A-47, A-116) that it completely failed to assess grazing impacts on sediment delivery and sedimentation. In so doing, the FSEIS also failed to assess the combined impact of grazing and action alternatives on cumulative sediment delivery, resulting sedimentation, and the INFISH RMO for width/depth ratio. Especially due to these major failures, the FSEIS needed to make

[1] According to the FSEIS (p. 178), Project area streams listed as Water Quality Limited Waterbodies by the of Oregon due to degraded water temperatures "…include Double Corral Creek, Fox Creek, Happy Camp Creek, Howard Creek, Indian Creek, Jackson Creek, Little Summit Creek, Marks Creek, North Wolf Creek, Ochoco Creek, Peterson Creek, Porter Creek, and Toggle Creek."

known the fraction of the area of each of the Project subwatersheds subjected to grazing in order to provide at least some index of width/depth ratio impacts due to grazing combined with trail impacts under the action alternatives.

Pool frequency is also an INFISH RMO which is strongly affected by grazing and cumulative sediment delivery at the scale of subwatersheds and watersheds (Rhodes et al., 1994; USFS and USBLM, 1997; McIntosh et al., 2000; Buffington et al., 2002; Beschta et al., 2013). Thus, the impacts of the action alternatives would combine with those from grazing to cumulatively affect pool conditions. The FSEIS admittedly failed to include grazing-caused sediment delivery (pp. A-46, A-47, A-116) in combination with those under the action alternatives, which are necessary to reasonably assess the cumulative impacts on the INFISH RMO for pools under the action alternatives. This defect made it even more critical for the FSEIS at least reveal the fraction of the area subjected to grazing in all of the Project subwatersheds to provide at least some index of pool impacts due to grazing combined with trail impacts under the action alternatives.

Studies have consistently documented that grazing greatly reduces bank stability (Rhodes et al., 1994; USFS and USBLM, 1997; Cowley 2002; Beschta et al., 2013; Batchelor et al., 2015), which is an INFISH RMO. This, too, makes it critical error that FSEIS failed to at least provide an index of cumulative bank stability impacts under the action alternatives by making known the area subjected to grazing in all Project subwatersheds and watersheds.

Grazing also contributes significantly to cumulative sediment delivery, which significantly degrades fine sediment levels in streams, which significantly reduces redband trout survival and production, as discussed in a following section. As with other sediment-related conditions affected by cumulative sediment delivery from grazing and action alternatives, the FSEIS's failure to evaluate sediment delivery from grazing made it crucial for the FSEIS to disclose the area subjected to grazing in all Project subwatersheds and watersheds.

For these reasons, the FSEIS's failure to make known area subjected to grazing in all Project subwatersheds and watersheds is a major defect.

The FSEIS failed to make known the extent and locations of user-created trails

The FSEIS (p. A-69) admits that it is devoid of information on the extent, location, and density of user-created trails at the scale of watersheds and subwatersheds, despite repeated comments on the FEIS that this was crucial to disclose (FSEIS, p. A-69). This information is critical to assess and make known for two other reasons.

First, these routes unquestionably contribute to cumulative sediment delivery at the watershed scales, affecting a host of RMOs and extremely important stream conditions, including pools, width/depth ratio, water temperature,[2] and fine sediment levels in streams. The FSEIS failed to make any quantitative estimate of sediment delivery from the user-created routes. Hence, it was critical for the FSEIS to make this information known at the scale of watersheds, to at least provide an index of their impacts.

[2] Increases in width/depth caused by elevated sediment delivery increases water temperatures even in the absence of shade loss (Rhodes et al., 1997; USFS and USBLM, 1997; Bartholow, 2000; Cowley, 2002)

Second, the FSEIS repeatedly asserts (e.g., p. 181) without any sound basis, that the action alternatives will ultimately result in sediment delivery that is lower than existing conditions due to reductions in sediment delivery from user-created trails. While this is a flawed assumption for several reasons, as will be discussed in greater detail, a primary one is that it is impossible for this to be sound absent information on the extent, density, and location of these trails at the scale of watersheds and subwatersheds, all of which exert a profound influence on sediment delivery from these trails. Simply enough, the FSEIS cannot assert that sediment delivery reductions from existing user-created routes will be greater than that generated from OHV trails under the action alternatives unless it knows the magnitude of sediment delivery from the latter, which requires complete information on the location, extent, and density of user-created trails at the scale of watersheds and subwatersheds.

The FSEIS attempts to have it both ways: a) that it is not a fatal flaw to quantitatively ignore sediment-related impacts from user-created trails; and, b) that reductions in sediment delivery from these trails will more than offset increases in sediment delivery under the action alternatives. Instead, the facts are that both of these contentions in the FSEIS are false.

For these reasons, the FSEIS has no sound basis for the notion that sediment delivery will decrease below existing conditions under the action alternatives (FSEIS, p. 181) in the absence of information on the extent, location and density of user-created trails at watershed scales. The failure to analyze and make this information known is a severe defect.

The FSEIS did not reasonably evaluate and make known existing stream conditions, and existing cumulative effects, because the vast majority of the stream and riparian data is exceedingly stale.

Much of the data in the FSEIS on instream conditions in watersheds and subwatersheds in the Project area are quite stale (FSEIS, pp. 145- 178). In fact, a considerable amount of this data is for historical conditions, because much of the data is not even from this decade. For instance, there is no data from this decade on stream conditions that would be affected by the action alternatives in the Elliot Creek subwatershed (FSEIS, Tables 74-75, pp. 147-148), Howard Creek subwatershed (FSEIS, Tables 77-78, pp. 151-152), Peterson Creek subwatershed (FSEIS, Tables 80 and 81, pp. 155-156) and Upper Marks subwatershed (FSEIS, Tables 97 and 98, p. 177). The bulk of the instream data for other subwatersheds are more than 10 years old, as is all of the subwatershed scale water temperature data in the FSEIS (pp. 145-178).

This is wholly inadequate because these conditions, that would be affected by action alternatives, can be rapidly degraded, due to the combination of existing management activities, such as grazing, logging, and roading, the pervasively poor riparian and watershed conditions throughout the project area, and/or triggering by natural disturbances, such as floods and fire. Affected conditions subject to relatively rapid degradation include fine sediment, width/depth ratio, pool frequency, water temperature, and bank stability. For instance, a single season of grazing can greatly reduce bank stability and increase width/depth ratio (Rhodes et al., 1994) and most of the Project area is annually afflicted by grazing.

Notably, the data on the density of redband trout in affected subwatershed corroborates that instream habitat conditions may have continued to deteriorate. This data is far more recent and is ample for assessing trends and it demonstrates that redband trout density has declined significantly in most subwatersheds for which data are available (FSEIS, Figures 8-10, 14-21, pp. 150-172).

While it is likely that stream conditions have deteriorated over time in most of the affected streams in the Project area, it is highly unlikely that there has been any appreciable improvement in these conditions. This is because the watersheds are in exceedingly poor condition due to high road density combined with pervasive grazing, as well as logging.

The FSEIS notes that *existing* conditions are used in the FSEIS as a proxy for existing cumulative effects. Because the majority of data in the FSEIS on fundamentally important stream conditions are stale, the FSEIS fails to reasonably assess the cumulative effects of existing conditions in combination with impacts of the action alternatives.

Further, much of the stale data is for INFISH RMO conditions. Thus, the FSEIS also failed to reasonably assess existing INFISH compliance and existing cumulative effects on RMOs.

THE FSEIS IMPROPERLY ADOPTED A SCIENTIFICALLY UNSOUND RMO FOR WIDTH/DEPTH RATIOS

Instead of using the INFISH RMO for width/depth ratios, the FSEIS adopted an RMO for this stream attribute (FSEIS, Table 64, p. 131) in a manner inconsistent with INFISH direction. INFISH (p. E-3) does allow modification of the interim RMOs in the absence of watershed analysis by amendment where "…watershed or stream reach specific data support the change." However, the adoption of the width/depth ratio RMO in the FSEIS was not by amendment and is not based on watershed or stream reach specific data that support the change made in the FSEIS. Further, the FSEIS provides no data to support the modification. Instead, the FSEIS only avows that it lacks data on width/depth conditions in reference reaches in the Project area and then adopts a width/depth RMO that is based on broad criteria used in a stream classification system (Rosgen, 1996) that are **not specific to the Project area.**

INFISH (p. E-3) also notes that RMO refinement should be based on "…local geology, topography, climate, and potential vegetation." In contrast, the RMO adopted for width/depth ratio in the FSEIS is not based on these local factors, but instead comes from broad classification system that is not based on local or even regional factors.

INFISH (p. E-3) directs that if INFISH RMOs are modified, "In all cases, the rationale supporting the RMOs and their effects would be documented." The FSEIS includes absolutely no assessment of the effect of this RMO modification.

The rationale for modifying this modification in the FSEIS is unsound, as is the adopted RMO. INFISH notes that RMOs should represent healthy stream and aquatic habitat conditions. In contrast, the width/depth RMO adopted in the FSEIS are width/depth criteria used in the Rosgen classification system. Notably, nowhere does the Rosgen classification system (Rosgen, 1994)

suggest that these criteria for channel type delineation be set as ecological goals, or that they represent healthy stream conditions for stream types. Instead, the classification system uses the criteria as thresholds breaks for categorizing streams into different types.

These classification thresholds that are adopted as RMOs by channel type do not represent healthy stream conditions. For instance, Rosgen (Figures 8-9, 1994) discuss E-type channels with a width/depth ratio of 0.5-2, which are fairly normal for undegraded E-type channels. In contrast, the RMO adopted in the FSEIS (p. 131) for this channel type is width/depth ratio < 12. This is not sound, because a width/depth ratio of 10 for an E-type channel represents a degraded condition that would be considered satisfactory under the unsound RMO adopted in the FSEIS.

The RMO adopted in the FSEIS also leads to preposterous results. For instance, a C-type channel with a highly degraded width/depth ratio of 100 would be considered to meet the adopted RMO because the adopted RMO for this channel type is width/depth ratio >12 with no upper bound.

For these reasons, the modification of the RMO does not meet INFISH guidance for such a change, is not site-specific, and is not scientifically sound.

THE FSEIS FAILS TO PROPERLY MAKE KNOWN IMPORTANT ASPECTS OF PROJECT ALTERNATIVES

The FSEIS did not make known the number of stream crossings by OHV routes on currently closed or decommissioned roads.

Stream crossings by OHV routes are a major vector for degradation of a host of riparian and stream conditions, including large woody debris (LWD), pools, fine sediment, water temperature, runoff regimes, and noxious weed spread in riparian areas. There is no question that re-opening decommissioned and closed routes for OHV use will increase sediment delivery at crossings to a far greater degree than from allowing OHV use on existing open roads. However, the FSEIS fails to make known the number of stream crossings under the action alternatives that would be on currently decommissioned and/or closed routes opened for OHV use. Instead, the FSEIS only attempts to make known the number of crossings on newly created or existing routes. Due to the nature of impacts at stream crossings, this renders the FSEIS defective.

The FSEIS asserts that some undisclosed length of user-created routes in undisclosed locations would be closed and rehabilitated under the action alternatives but not under the No Action alternative.

The FSEIS repeatedly asserts that some user-created routes would have closure and possibly rehabilitation treatments under the action alternatives. Notably, the FSEIS provides no specificity whatsoever regarding the magnitude or location of these activities under the alternatives. They are also clearly contingent on funding that currently doesn't exist and potential for which the FSEIS (p. 57) states is "**outside the scope of this project**."

To recap, much of the FSEIS assessment of cumulative effects analysis relies on the notion that an unspecified amount of user-created roads in unspecified locations in unspecified watersheds will be treated by unspecified remedial activities of unknown effectiveness at an unspecified rate under the action alternatives with funding that is not only uncertain, but that the probability of obtaining is "…outside of the scope of project." There is not much reality to this scenario but nonetheless, this spun cloth is repeated in mantra-like fashion in the FSEIS.

Further, doing something to reduce damage from user-created trails, especially those within riparian habitat conservation areas, is not discretionary. INFISH requires that it be done. It is not something that can be ignored under the No Action alternative, if the ONF is to comply with INFISH.

The FSEIS's attempts at disclosing existing conditions and important aspects of the action alternatives at the watershed and subwatershed scales are so riddled with error that it is not possible to reliably ascertain the impacts and nature of the action alternatives at the watershed and subwatershed scales.

The FSEIS's discussion of aspects of the action alternatives fails to clearly convey aspects of the alternatives that are critical to describing the nature of the alternatives due to numerous errors. Examples of such problems include the following, which is not an exhaustive list of erroneous information in the FSEIS:

- The FSEIS (p. 128) states "From Table 65, the overall ratings for the Ochoco Summit Project area came out as 'properly functioning' for both the Upper and Lower Big Marsh Creek subwatersheds." However, Table 65 (p. 141) only contains hydrologic unit codes for some watersheds and subwatersheds in the Project area and table contains no condition ratings. Further, neither Upper nor Lower Big Marsh Creeks are listed anywhere in the FSEIS as being within the Project area.
- The first row of in Table 75 (FSEIS, p. 148) which provides water temperature data in the Elliott Creek subwatershed does not add up in terms of sample numbers. This row in the table indicates that 113 seven-day averages of water temperature data were calculated, but the categorical data in the row adds up to 123 seven day averages. The sixth row in this table indicates that 121 seven day averages of water temperature were calculated, but the categorical data adds up to only 120 seven day averages. A reader is unable to discern which parts of these data on water temperature are correct.
- The FSEIS (p. 191) states that under Alt. 2 "[a]pproximately **1.3 miles of new trail** would be added within 300 feet of an intermittent or perennial stream…" in the Peterson Creek subwatershed. However, the following paragraph states that under the same alternative "approximately **3.3 miles of new trail** would be added within 300 feet of an intermittent or perennial stream…" in the Peterson Creek subwatershed. These are substantial differences with substantially different impacts on riparian areas and aquatic systems. Due to these contradictions, it is entirely unclear which statement is correct, or given the contradictions, if either statement is correct.
- The FSEIS (p. 194) states that under Alt. 2 proposed trails would "…cross streams at **ten new locations** …" in the Jackson Creek subwatershed. However on this same page another paragraph states that Alt. 2 adds "…nine new intermittent or perennial stream

crossings to the existing number of stream crossings by roads in the Jackson Creek Subwatershed…" in the Jackson Creek subwatershed. These are substantial differences with substantially different impacts on riparian areas and aquatic systems. Due to these contradictions it is entirely unclear which statement is correct, or given the contradictions, if either statement is correct.

- The FSEIS (p. 199) states that under Alt. 2 proposed trails in the **Upper Ochoco Creek Watershed** include **"…approximately 3 miles of trail on closed roads, 0.1 mile on decommissioned road, and 8 miles on new routes.**" However on this same page in another paragraph, the FSEIS states that under Alt. 2 "…**approximately 8 miles of trail are proposed on closed roads, decommissioned, and open roads..." and about 5.3 miles of new trail** are proposed to be constructed in the Upper Marks Creek subwatershed, which is in the Upper Ochoco Creek watershed**.** These are substantially different with substantially different impacts on riparian areas and aquatic systems. Both statements cannot be correct. Due to these contradictions it is entirely unclear which statement is correct, or given the contradictions, if either statement is correct.
- The FSEIS (Table 101, p. 201) the first two columns of data indicate that under Alt. 2 there would be **25 crossings** by new routes and existing roads for OHV in the Elliott Creek subwatershed. However, in the same table, the columns of data for stream crossings by stream type indicate there would **29 crossings** of perennial, ephemeral, and intermittent streams by OHV routes in the Elliott Creek subwatershed. Further, in the same table the data for crossing type for the subwatershed only adds up to **24 crossings.** Crossings are points of major stream and riparian damage by a host of impacts, so these substantial differences in crossing numbers in the subwatershed would cause substantially different impacts. However, due to these contradictions in not possible to know which, if any. of these crossing numbers are correct for the Elliott Creek subwatershed.
- The FSEIS (Table 101, p. 201) the first two columns of data indicate that under Alt. 2 there would be **22 stream crossings** by new routes and existing roads for OHV in the Jackson Creek subwatershed. However, in the same table, the data for the type of stream crossed indicates that there would be **31 stream crossings of perennial, ephemeral and intermittent streams** under Alt. 2 in the Jackson Creek subwatershed**.** These same problems occur for other subwatersheds listed in Table 101: the number of stream crossings by new and existing routes is consistently and significantly less than the number of crossings of perennial, ephemeral and intermittent streams provided in the table. Crossings are points of major stream and riparian damage by a host of impacts, so these substantial differences in crossing numbers in the subwatershed would cause substantially different impacts. Due to these contradictions in the data, it is not possible to know which, if any, of these crossing numbers in Table 101 are correct for the affected subwatersheds.
- The caption for Table 115 (FSEIS, p. 219) states that the table provides a comparison of road plus trail stream crossing densities by subwatershed for **Alt. 3 and Alt. 5**. However, in this table, the column header for the data on differences in crossings states that the data are for **Alt. 2 and Alt. 5.** Due to these contradictions it is impossible to ascertain which alternative the data corresponds to.
- The caption for Table 116 (FSEIS, p. 221) states that the table provides a comparison of miles of existing roads and proposed trails within 300 feet of streams for **Alt. 3 and Alt. 5**. However, in the Table the column headers indicate that mileage data for these routes

by subwatershed are for **Alt. 2 and Alt. 5**. The column header for the data on differences in this mileage indicates that the differences are for **Alt. 2 and Alt. 5.** Due to these contradictions it is impossible to ascertain which alternative the data corresponds to.

- The caption for Table 117 (FSEIS, p. 223) states that the table provides a comparison of stream crossings for **Alt. 3 and Alt. 5**, but table the column headers indicate that the crossing data are for **Alt. 2 and Alt. 5**. Due to these contradictions it is impossible to ascertain which alternative the data is for. Due to the impacts of crossings on aquatic systems this ambiguity is highly significant.
- The narrative describing Table 118 (FSEIS, p. 222) states that the table "…displays estimated sediment contribution from road/trail crossings and road/trail segments within 300 feet of streams in project area subwatersheds for **Alternative 3 and Alternative 5.** The final column in the table compares the difference in sediment produced in tons/year between **Alternative 3 and Alternative 5."** (emph. added). However, the columns in Table 118 indicate that the data are for **Alt. 2 and 5**. This contradictory information creates confusion about significant aspects of the Project alternatives where clarity is absolutely essential for understanding the nature of the alternatives and their aquatic impacts.
- The FSEIS (p. 216) states: "For trail miles and crossings in RHCAs by watershed and by stream class, see Appendix D." However, the FSEIS has no Appendix D. As of 10/28/16, there was no Appendix D on ONF's online collection of environmental analyses associated with the Project: http://data.ecosystem-management.org/nepaweb/nepa_project_exp.php?project=26807 This is critical information related to the nature of the alternatives and their impacts, so this is a major error.

The foregoing is not an exhaustive listing of the major and pervasive contradictions in data regarding the location and nature of trail impacts associated with the action alternatives. However, it does amply indicate that these contradictions create confusion rather than clarity regarding these important aspects of the Project alternatives. As a result, the FSEIS has failed to clearly convey the nature of the action alternatives.

SEDIMENT-RELATED IMPACTS OF THE ACTION ALTERNATIVES

The FSEIS's assessment of sediment-related impacts of the action alternatives and cumulative effects of these alternatives and existing conditions remains extremely defective in several ways. These defects are significant, because the cumulative effect of sediment delivery from roads, routes, and livestock grazing on the ONF has adverse effects on host of stream conditions, including those set as Riparian Management Objectives (RMOs) in INFISH. RMOs affected by sediment delivery include those for pools, stream width/depth ratio, and water temperature. Therefore, the FSEIS fails to properly assess compliance with these INFISH RMOs and related INFISH standards, due to the defects in the FSEIS's assessment of cumulative sediment delivery under the action alternatives. Due to the manifold defects related to sediment impacts, the FSEIS fails to properly disclose the alternatives' effects on stream conditions, water quality, and aquatic biota.

The sediment-related degradation of pools, width/depth ratio, and water temperature adversely affects redband trout in several ways. Elevated sediment delivery also adversely affects fine sediment levels, which profoundly reduces the survival and production of redband trout. However, the FSEIS does not properly assess the alternatives' direct and cumulative impacts on fine sediment levels and resulting impacts on redband trout. In so doing, the FSEIS failed to properly assess the action alternatives' inconsistency with INFISH standard RM-1 which requires the avoidance of adverse impacts from recreation activities and facilities on inland fish. These numerous, serious defects persist despite my previous comments which clearly identified these defects.

The FSEIS did not properly assess cumulative sediment delivery under the action alternatives.

Livestock grazing

An overarching flaw in the FSEIS's assessment of sediment-related impacts is that the FSEIS did not assess the cumulative impacts of sediment delivery under the action alternatives. The FSEIS's repeatedly admits (e.g., pp. A-46, A-47, A-116) that its estimates of sediment delivery at the scale of watersheds and subwatersheds completely ignore sediment delivery from livestock grazing. This fatal flaw with respect to cumulative impacts on aquatic systems persists despite my previous comments and those of many others, including ODFW. This is major failure in the FSEIS is a severe defect for several reasons.

First, it is extremely well-established that livestock grazing greatly elevates sediment delivery to streams via several mechanisms, including direct bank damage from trampling, loss of bank stability, gullying, loss of soil cover, increased runoff due to soil compaction, and vastly elevated levels of channel erosion, which deposits sediment directly into streams (Rhodes et al., 1994; USFS and USBLM, 1997; Beschta et al., 2013). It is well-documented that grazing impacts that increase are particularly profound in riparian areas and that grazing greatly increases bank erosion.

Second, the failure to assess management-induced sediment delivery from grazing is a major flaw due to the extent of livestock grazing within the Project area. There are portions of 25 active allotments within the Project area (FSEIS, p. 52). Although the FSEIS fails to disclose the total area subjected to grazing within the Project area and affected subwatersheds,[3] the FSEIS states (p. 388) "Cattle grazing occurs on most of the project area." Based on the extent of grazing and its innate impacts, it is likely that accelerated sediment delivery from grazing is a highly significant fraction of the total management-induced sediment delivery under the action alternatives in all watersheds and subwatersheds. Therefore, the FSEIS clearly failed to properly determine cumulative sediment delivery under the action alternatives and related aquatic impacts due to the FSEIS's failure to include management-induced sediment delivery from grazing impacts.

Third, sediment-related channel conditions, such as pools, width/depth ratio, and fine sediment levels are affected by cumulative sediment delivery. The increased sediment delivery to streams

[3] This failure persists despite my comments on the FEIS, which discussed the necessity of disclosing and assessing it at the scale of subwatersheds and the Project area.

from grazing is significant and has many negative impacts on aquatic conditions, including those that are INFISH RMOs and adversely affect redband trout. As the Forest Service acknowledged in USFS and USBLM (1997):[4]

> "Grazing is a major nonpoint source of channel sedimentation (Dunne and Leopold 1978; MacDonald and others 1991; Meehan 1991; Platts 1991). Grazed watersheds typically have higher stream sediment levels than ungrazed watersheds (Lusby 1970; Platts 1991; Rich and others 1992; Scully and Petrosky 1991). Increased sedimentation is the result of grazing effects on soils (compaction), vegetation (elimination), hydrology (channel incision, overland flow), and bank erosion (sloughing) (Kauffman and others 1983; MacDonald and others 1991; Parsons 1965; Platts 1981a; 1981b; Rhodes and others 1994). Sediment loads that exceed natural background levels can fill pools, silt spawning gravels, decrease channel stability, modify channel morphology, and reduce survival of emerging salmon fry (Burton and others 1993; Everest and others 1987; MacDonald and others 1991; Meehan 1991; Rhodes and others 1994)...Compared to ungrazed sites, aquatic insect communities in stream reaches associated with grazing activities often are composed of organisms more tolerant of increased silt levels, increased levels of total alkalinity and mean conductivity, and elevated water temperatures (Rinne 1988)."

Available scientific evidence clearly demonstrates that elevated cumulative sediment delivery, including that from grazing, degrades width/depth ratios (Rhodes et al., 1994; Beschta et al., 2013), the frequency, volume, and quality of pools (USFS et al., 1993; Rhodes et al., 1994; USFS and USBLM, 1997; McIntosh et al., 2000), both of which are RMOs. Therefore, it is impossible for the FSEIS to assess compliance with INFISH RMO standards affected by sediment delivery in the absence of a thorough assessment of sediment delivery from grazing.

Increased sediment delivery from grazing also degrades water quality by elevating suspended sediment levels and turbidity. Elevated suspended sediment adversely affects fish, water quality, and water resources (Rhodes et al., 1994). Elevated turbidity can contribute to violations of state water quality standards for turbidity.

Numerous lab and field studies have repeatedly documented that increases in cumulative sediment delivery increase fine sediment levels in streams (Rhodes et al., 1994; USFS and USBLM, 1997; Buffington and Montgomery, 1999; Hassan and Church, 2000; Kappesser, 2002; Cover et al., 2008). Thus, sediment delivery from grazing, which is a significant fraction of cumulative sediment delivery in affected subwatersheds, must be assessed in order to reasonably evaluate cumulative effects on fine sediment levels in those watersheds.

For these reasons, credible assessment of impacts on turbidity, pools, width/depth ratio, fine sediment levels, and other sediment-related impacts on fish require the assessment of the impacts of cumulative sediment delivery on these stream conditions.

[4] USFS and USBLM (1997) assessed aquatic conditions and the effects of management activities on USFS and USBLM lands in the interior Columbia basin, including the ONF. This salient finding by the USFS is never disclosed in the FSEIS or any of the previous EIS's for the Project, although it was provided to the ONF in my previous comments.

However, the FSEIS repeatedly acknowledges that it fails to include any quantitative estimate of cumulative sediment delivery, including that from grazing. Instead, the FSEIS only provides some estimates of sediment delivery from roads and trails, which are not a surrogate for assessment of cumulative management-induced sediment delivery, because it may not even constitute the majority of management-induced sediment delivery. Therefore, as will be discussed in greater detail, the FSEIS's assessment of the action alternatives' compliance with INFISH is completely flawed due to the FSEIS's failure to properly evaluate the effects of cumulative management-induced sediment delivery under the action alternatives, including that from pervasive grazing impacts, on RMO standards for width/depth ratio and pools.

The FSEIS's complete failure to assess cumulative sediment delivery to streams, including that from livestock grazing, also renders the FSEIS's assessment of the fine sediment impacts highly defective. The FSEIS incorrectly assumed (e.g., pp. 137) that sediment delivery to streams that is below an assumed threshold of 35%[5] over the estimated natural sediment delivery background does not increase fine sediment levels. While available scientific information, including that in the model that the ONF used incorrectly to assess in-channel sediment impacts (Stowell et al., 1983), indicates that this impact threshold is not valid, the FSEIS failed to reasonably assess if the magnitude of cumulative sediment delivery in Project watersheds and subwatersheds is greater than 35% over natural background, because the FSEIS ignored major and pervasive contributions to sediment delivery from grazing. This is highly significant because, as previously noted, livestock grazing, even in the absence of other impacts, elevates fine sediment levels in streams (Rhodes et al., 1994; USFS and USBLM, 1997). It is highly likely that if management-induced sediment delivery from grazing had been properly assessed and included in a cumulative sediment delivery estimates, it would show that cumulative management-induced sediment delivery under the action alternatives in Project area watersheds and subwatersheds is more than 35% over estimated natural background levels. Therefore, the failure to include sediment delivery from grazing impacts is a severe defect with respect to the FSEIS's assessment of impacts on fine sediment levels under the action alternatives.

Proposed OHV routes

The FSEIS estimates of sediment delivery from OHV routes is also defective because these estimates do not reflect that available data has consistently shown that sediment delivery from OHV routes is far greater than from roads. The FSEIS (p. A-46) relied on erosion rates for roads to estimate sediment delivery from OHV routes within 300 feet of streams and at stream crossings.[6] This results in considerable and consistent underestimation of sediment delivery from OHV routes because field studies have consistently demonstrated that sediment delivery

[5] The significant problems with the assumed fine sediment impact threshold in the FSEIS is discussed in greater detail in these comments. This was also communicated to the ONF in my comments on the FEIS. Despite this information, the FSEIS still grossly mischaracterizes the information in Stowell et al. (1983) in ways that distort the information in Stowell et al. (1983) regarding sediment delivery and fine sediment impacts.

[6] The FSEIS (p. A-46) incorrectly asserts that the modeling approach is conservative because OHVs cause less damage to road surfaces than heavier log trucks for which road erosion rates are derived. However, Meadows et al. (2008) which is cited in FSEIS clearly documented that lighter OHVs caused as much damage to road surfaces and elevated erosion than much heavier vehicles. Therefore, the FSEIS once again distorts available information rather than reporting it properly.

from OHV routes is several times higher than from roads (Foltz, 2006; Meadows et al., 2008; Welsh, 2008). Welsh (2008) documented that mean sediment production from roads was **six times higher** than that from roads and that the WEPP model used in the FSEIS failed to accurately estimate sediment production from OHV routes, because it consistently underestimated sediment production from these routes. For these reasons, it the FSEIS significantly underestimated sediment delivery from OHV routes, and, hence impacts on sediment-related conditions, including turbidity, width/depth ratios, pools, and fine sediment levels in streams.

Notably, the FSEIS (p. 238) incorrectly asserts that the documentation of far greater erosion and sediment delivery from OHV routes relative to roads (Foltz, 2006; Meadows et al., 2008; Welsh, 2008) is not relevant to the Project because the results are from "unmanaged" OHV use. However, this is a baseless assumption in the FSEIS. None of these studies indicate that the results were from uncontrolled, unmanaged use. Therefore, the FSEIS assumption is baseless, as is its effort to ignore available scientific evidence documented by USFS research on OHV impacts on erosion and sediment delivery.

The FSEIS (A-63) further obfuscates these documented scientific findings by incorrectly characterizing the discussion of these results in my FEIS comments as being from "illegal OHV trails[7] that have no drainage features or other water quality design criteria applied to them." There is absolutely no information in these studies comments indicating that the studied trails had no drainage features. These study results were certainly not from "illegal trails," but rather trails open to OHV use on several forests. These incorrect characterizations in the FSEIS further occlude, rather than properly disclose, the documented effects of OHVs on erosion and sediment delivery from OHV routes proposed under the Project's action alternatives. Further, the FSEIS is devoid of an iota of scientific documented information indicating that "managed" OHV use results in fundamentally different levels of erosion and sediment from OHV trails than those documented in these studies (Foltz, 2006; Meadows et al., 2008; Welsh, 2008).

Existing user-created OHV routes

The FSEIS concedes that it did not estimate sediment delivery from existing user-created routes The FSEIS (p. A-69) admits that FSEIS is does not even include information on the extent, location, and density of user-created trails at the scale of watersheds and subwatersheds, despite repeated comments on the FEIS that this was crucial to disclose (FSEIS, p. A-69). Absent information on extent and location of the routes, the FSEIS does not even have an index of the sediment-related impacts of these existing routes. This is a fatal error with respect to impact assessment of the action alternatives for two major reasons.

First, several RMOs, including pools, width/depth ratio, and water temperature are affected by *cumulative* sediment delivery at the scale of subwatersheds and watersheds. Sediment delivery from user-created routes contributes to cumulative sediment delivery. Therefore, by failing to assess sediment delivery from these routes, the FSEIS fails to properly assess cumulative impacts

[7] It is ironic that FSEIS baselessly assumes the trails in the cited research are "illegal" because the FSEIS repeatedly notes that routes are not illegal if they predate a signed Travel Management Plan (e.g. FSEIS, pp. A-129 A-144). The cited research contains no information that the trails studied came after a signed Travel Management Plan.

on RMOs under the action alternatives. Thus, the FSEIS does not reasonably assess compliance with INFISH, due to the failure to incorporate sediment delivery from these routes in its analysis of RMO impacts.

The FSEIS indicates that the ONF believes that sediment delivery from these user-created routes is substantial because FSEIS repeatedly states that sediment delivery in the Project area will be reduced as sediment delivery from user-created routes abate, despite increased erosion and sediment delivery from OHV trails under the action alternatives. Taking this at face-value clearly indicates that the FSEIS omits a major source of management-induced sediment delivery in its purported cumulative effects analysis for the alternatives, because FSEIS's estimates of the sediment delivery do not include that from user-created routes.

Similarly, cumulative sediment delivery also affects turbidity and fine sediment levels, which affect the survival and production of redband trout. Thus, by failing to include sediment delivery from user-created routes, the FSEIS fails to properly ascertain the cumulative effects of the action alternatives on fine sediment levels, red band trout, and turbidity. Because the FSEIS does not properly assess cumulative impacts on turbidity, it has failed to reasonably determine compliance with state water quality standards for turbidity.

Second, the FSEIS repeatedly asserts, without any sound basis, that cumulative sediment delivery under the action alternatives will ultimately decrease below existing conditions, due to remediation measures on user-created trails under the action alternatives. Plainly, this assertion is baseless without a quantitative notion of the magnitude of existing sediment delivery from user-created routes. Therefore, this repeated assertion in the FSEIS that cumulative sediment delivery will eventually be lower than under the no-action alternative has absolutely no merit.

However, there are several other severe problems with the FSEIS's baseless assertion that the action alternatives would significantly reduce sediment delivery in the Project area due to remedial treatments on user-created trails. First, the FSEIS fails to provide any estimate of the magnitude of these trails would be treated under the action alternatives. Absent such a credible estimate, it is impossible to reasonably estimate any magnitude of sediment reduction on user-created trails in the Project area.

Second, the FSEIS provides no notion of the location of these trails that might be treated under the action alternatives. Similarly the FSEIS provides no information on stream proximity of these trails. Both factors strongly influence sediment delivery to streams. Thus, due to the absence of this information the FSEIS's assertions regarding sediment delivery from user-created routes under the action alternatives has no merit.

Third, the FSEIS provides no specifics on treatments that would be used to attempt to reduce sediment delivery from user-created roads. Absent such specifics, effectiveness is unknown.

Fourth, the FSEIS suggests that additional efforts will be made to effectively close these routes to use. However, information in the FSEIS (p, 186) indicates that route closures have not been effective at preventing OHV use of closed routes.

Fifth, even trail obliteration and ripping, which are relatively expensive treatments, are not particularly effective at reducing erosion and runoff, even over the course of several years. USFS research has shown that such treatments result in nominal improvement in conditions that affect erosion and sediment delivery from the vehicular routes, even after several years and that data indicates that it is unclear if complete recovery would ever occur even with these treatments (Foltz et al., 2007). Hence, it is unlikely that even with relatively costly treatments that sediment delivery from treated user-created routes would ever be appreciably reduced.

Sixth, funding for these treatments under the action alternatives is not reasonably certain to occur. In fact, the FSEIS considers the probability of obtaining such funding to be outside of the scope of the Project. Thus, the unspecified funding-dependent treatments are far from reasonably certain to occur.

In aggregate, these problems fully undermine the FSEIS's repeated assertion that under the action alternatives sediment delivery in the Project area would eventually be reduced relative to existing conditions. Therefore, the FSEIS misleads rather than making known the likely impacts of the alternatives on sediment delivery and sediment-related impacts on RMOs, fine sediment levels, redband trout, and water quality.

Logging

It is extremely well-documented that logging elevates sediment delivery for several years (USFS, 1993; Rhodes et al., 1994; USFS and USBLM, 1997). Copious amounts of logging have occurred in many watersheds based on the Equivalent Harvest Acres (EHA) estimates in the FSEIS (p. 231). There is no indication that the FSEIS included any effort to estimate sediment delivery from logging and include it in estimates of cumulative sediment delivery under the action alternatives at the scale of watersheds and subwatersheds.

This is a major defect for the same reasons as for the omission of sediment delivery from other sources in the FSEIS. Cumulative sediment delivery affects several RMOs, fine sediment levels in streams, redband trout survival and production, and water quality. Thus, by failing to estimate sediment delivery from logging as part of cumulative sediment delivery under the action alternatives the FSEIS fails to properly assess compliance with INFISH and effects on RMOs, redband trout, and water quality.

Conclusion

The FSEIS clearly did not properly estimate management-induced sediment delivery under the action alternatives because it omitted major contributions from pervasive grazing, user-created routes, and logging. Due to the extent and nature of these sources of management-induced sediment delivery, it is likely that the sediment delivery estimates in the FSEIS for OHV trails only constitute a minor fraction of management-induced sediment delivery in affected watersheds and subwatersheds. For these reasons, the FSEIS fails to properly assess cumulative effects of sediment delivery under the action alternatives on a host of important conditions, including RMOs, INFISH compliance, redband trout, and water quality.

The FSEIS did not properly assess the adverse cumulative impacts on fine sediment levels in streams and resulting adverse effects on redband trout under the action alternatives.

The FSEIS failed to properly determine that the cumulative effects under the action alternatives will increase fine sediment levels and thereby adversely affect redband trout. This failure is due to several severe defects in the FSEIS's assessment of cumulative sediment delivery, its effects on fine sediment, and resulting impacts on redband trout.

First, the FSEIS (e.g., pp. 137, 185, 189, 193) consistently and incorrectly assumed that increases in watershed and subwatershed sediment delivery that are less than 35% over natural background levels have no significant effect on fine sediment conditions in C-type channels. This assumption is not only unwarranted, but in direct conflict with available scientific information, including the very approach the FSEIS incorrectly cites as the basis for this claim (Stowell et al., 1983). Contrary to the FSEIS's unsound assumption regarding sediment delivery and fine sediment impacts, numerous field and laboratory studies have consistently demonstrated that increases in sediment delivery increase fine sediment in streams, especially when the sediment delivery is primarily comprised of fine sediment (Rhodes et al., 1994; Buffington and Montgomery, 1999; Hassan and Church, 2000; Cover et al., 2008). Notably, management-induced sediment delivery from roads, OHV trails, and grazing is primarily comprised of fine sediment. Therefore, contrary to the unsound assumption in the FSEIS, increases in sediment delivery, both cumulative and from the OHV trails, will contribute to increases in fine sediment.

The FSEIS relies solely Stowell et al. (1983) for the incorrect notion that management-induced sediment delivery less than 35% over natural background levels has no significant effect on fine sediment conditions and stream aggradation. This is a gross mischaracterization of the explicit information in Stowell et al. (1983). The narrative in Stowell et al. (1983) clearly states that the model is based on the well-documented result that as sediment delivery increases, so to does fine sediment and cobble embeddedness in streams.

Stowell et al. (p. 24, 1983) clearly provide an equation relating levels of cumulative management-induced sediment delivery to increases fine sediment levels in a C-type channel, as follows:

$FS_f = FS_e + 0.12*(x)$

where: FS_e = existing fine sediment levels
x = **cumulative management-induced** sediment delivery as estimated by the **R1-R4 sediment delivery** model expressed in terms of percent estimated natural sediment delivery
FS_f = future fine sediment level caused by cumulative management-induced sediment delivery

Casual inspection of this equation clearly indicates that for **any** increment of increased sediment delivery, the model predicts an increase in fine sediment levels, which is in direct conflict with the FSEIS's spurious characterization of the results in Stowell et al. (1983). This response equation for fine sediment and sediment delivery indicates that threshold for zero increase in fine

sediment levels is zero management-induced sediment delivery, contrary to the gross misinterpretation in the FSEIS.

Further, Stowell et al. (p. 24, 1983) provides an explicit calculation of increased fine sediment using the foregoing equation in an example where existing fine sediment is initially 26.9% in a C-type channel and cumulative management-induced sediment delivery from the R1-R4 model is estimated to be **32%** over natural (well below the incorrect and mischaracterized 'threshold' the FSEIS ascribes to Stowell et al. 1983). This explicit example in Stowell et al. (1983) increases fine sediment levels from 26.9% to 30.7%. Here's the excerpted calculation from a scan of Stowell et al. (1983):

$$Y_2 = 26.9 + 0.12(32) = 30.7\%$$

where: $Y_2 = FS_f$ = future fine sediment level caused by cumulative management-induced sediment delivery = 30.7% in this example

Plainly, this directly conflicts with the FSEIS's fabrication that Stowell et al. (1983) indicates that there are no increases in fine sediment levels when management-induced sediment delivery is less 35% over natural sediment delivery.

Importantly, based on the survival curves in Stowell et al. (1983), this resulting increase in fine sediment levels from 26.9% to 30.7% would significantly reduce salmonid survival. Thus, the FSEIS relies on a complete distortion of the findings and methods of Stowell et al. (1983).

Stowell et al. (1983) indicates even larger increases in cobble embeddedness, which significantly impair salmonid survival and production, per increment of increase in cumulative management-induced sediment delivery. Stowell et al. (p. 24, 1983) clearly provide an equation relating levels of cumulative management-induced sediment delivery to increases in cobble embeddedness in a C-type channel, which is as follows:

$CE_f = CE_e + 0.16*(x)$

where: CE_e = existing cobble embeddedness

x = **cumulative management-induced** sediment delivery as estimated by the **R1-R4 sediment delivery** model expressed in terms of percent estimated natural sediment delivery

CE_f = future fine sediment level caused by cumulative management-induced sediment delivery.

Again, casual inspection of this equation by even a pedestrian analyst clearly indicates that for **any** increment of increased sediment delivery, the model predicts an increase in cobble embeddedness, which is in direct conflict with the FSEIS's spurious characterization of the results in Stowell et al. (1983). This response equation for cobble embeddedness and sediment delivery does not have any threshold for management-induced sediment delivery below which an increase in cobble embeddedness is not predicted to occur, other than zero management-induced sediment delivery.

Stowell et al. (p. 24, 1983) provides an explicit calculation of increased cobble embeddedness using the foregoing equation in an example where existing cobble embeddedness is initially 36.4% in a C-type channel and cumulative management-induced sediment delivery from the R1-R4 model is estimated to be **32%** over natural (below the incorrect and mischaracterized 'threshold' the FSEIS ascribes to Stowell et al. 1983). This explicit example in Stowell et al. (1983) increases cobble embeddedness from 36.4% to 41.5%. Here's the excerpted calculation from a scan of Stowell et al. (1983):

$Y_2 = \underline{36.4} + 0.16(32) = 41.5\%$ embeddedness

$Y_2 = CE_f$ = future cobble embeddedness caused by cumulative management-induced sediment delivery = 41.5% in this example.

Importantly, based on the information Stowell et al. (1983), this resulting increase in cobble embeddedness from 36.4% to 41.5 % would significantly reduce the salmonid rearing capacity of aquatic habitat. Thus, the FSEIS relies solely on a distortion of the findings and methods of Stowell et al. (1983).

The foregoing clearly demonstrates that the FSEIS's characterization of the information in Stowell et al. (1983) is fabricated and directly conflicts with the actual information in Stowell et al. (1983) regarding expected changes in substrate conditions due to management-induced sediment delivery. Because this fabrication is relied upon in the FSEIS for its assessment of sediment-related impacts on fine sediment conditions and redband trout, the FSEIS's assessment of the cumulative sediment-related impacts on redband trout under the action alternatives is terminally defective.

I am quite familiar with Stowell et al. (1983), having used it many times over decades of work, as well as having evaluated it in detail at the behest of NMFS in a peer-reviewed report produced under contract with NMFS (Rhodes, 1996) during my tenure with the Columbia River Inter-Tribal Fish Commission. I also recently conferred about the model with Al Espinosa, retired USFS fish biologist, who performed most of the statistical analysis in Stowell et al. (1983), and is a primary author of the publication.

There are several other problems with the way that the FSEIS grossly misused the approach in Stowell et al. (1983). First, the documentation in Stowell et al. (1983) clearly state that it is **only** for use with the sediment delivery estimation methods in the R1-R4 model. The method of Stowell et al. (1983) can only be used with the estimates of cumulative management-induced sediment delivery from the R1-R4 sediment model because all of the response equations for fine sediment and sediment delivery were developed from calibrations with the R1-R4 output (*pers. comm.,* A. Espinosa, 10/23/16). However, the FSEIS used "WEPP" to estimate sediment delivery from proposed OHV routes (FSEIS, p. 140), which is not valid for use with Stowell et al. (1983).

Second, the method of Stowell et al. (1983) is based on estimating sediment response to **cumulative management-induced sediment delivery**, as corroborated by a primary author of Stowell et al. (1983) (*pers. comm.,* A. Espinosa, 10/23/16), because cumulative sediment

delivery affects fine sediment response in streams. As previously discussed, the FSEIS is devoid of a credible assessment of cumulative management-induced sediment delivery, because it ignored sediment delivery from grazing, logging, and user-created roads. It is not valid to use the model to estimate potential changes in fine sediment conditions based on only consideration of a fraction of the cumulative sediment delivery in watersheds (*pers. comm.,* A. Espinosa, 10/23/16), as was done in the FSEIS.

Notably, the WEPP model used in the FSEIS to estimate sediment delivery from routes is an inappropriate for estimating cumulative sediment delivery in the Project area. This is because the WEPP model is incapable of estimating accelerated channel erosion and it is well-documented that one of the principal ways that grazing elevates sediment delivery is via accelerated channel erosion (Rhodes et al., 1994; USFS and USBLM, 1997; Cowley, 2002; Beschta et al., 2013).

Third, Stowell et al. (1983) very clearly note that the method should use existing substrate conditions (cobble embeddedness and fine sediment levels) as the starting place for estimating impacts, as shown in the equations previously discussed. The FSEIS clearly did not do this. Instead, it repeatedly substitutes irrelevant statements about how Stowell et al. (1983) indicates that fine sediment levels of less than 20% have limited adverse impacts on redband trout, which steadfastly ignores that the available data in the FSEIS indicate that many streams in the project area have fine sediment levels that are well in excess of 20% (FSEIS, pp. 147, 155, 158, 163-165, 169, 173, 176) which Stowell et al. (1983) clearly indicates are reducing salmonid survival and production.

Fourth, the FSEIS never actually applied any of the equations in Stowell et al. (1983) for changes in fine sediment in response to sediment delivery. Instead, the FSEIS only repeats fabricated mischaracterizations of the information in Stowell et al. (1983) regarding stream substrate response to management-induced sediment delivery.

For these combined reasons, the FSEIS's use of Stowell et al. (1983) is invalid because it conflicts with the directions for how to use the model and the model itself. Due to the reliance on a complete misunderstanding of Stowell et al. (1983) the FSEIS's assessment of cumulative impacts on redband trout under the action alternatives is bankrupt.

Fine sediment conditions in streams in several subwatersheds and watersheds analyzed in the FSEIS conclusively demonstrate that assumption that management-induced sediment delivery as estimated in the FSEIS must exceed 35% over natural background levels to have a negative effect on fine sediment conditions is wholly unsound. Several of these streams have elevated levels of fine sediment (>20%) that harm redband trout survival and production even though the FSEIS erroneously estimates that sediment delivery is far below the assumed adverse effect threshold of 35% over natural background (FSEIS pp. 147-201). This site-specific data from the ONF clearly demonstrates that FSEIS's assumptions regarding the threshold of sediment delivery magnitude that causes elevated fine sediment levels that are injurious to redband trout is wholly unsound. For these combined reasons, the use of this threshold, which is in conflict with available scientific literature, including Stowell et al. (1983), and site-specific evidence from streams in the project area, is not sound. As a result of this unsound assumption, the FSEIS fails

to properly assess that the increases in sediment delivery caused by the action alternatives will elevate fine sediment levels that harm redband trout.

The FSEIS incorrectly assumes that fine sediment added to redband trout streams under the action alternatives do not harm redband trout and that fine sediment levels less than 20% do not reduce redband survival and production. Research has demonstrated that a*ny* increase in fine sediment significantly impairs steelhead growth and production (Suttle et al., 2004), which likely applies to redband trout.[8] Bryce et al. (2010) demonstrated that fine sediment levels in excess of 13% cause significant alterations of aquatic food webs upon which redband depend. Therefore, this information strongly demonstrates that the FSEIS's assumptions regarding the threshold of fine sediment levels that adversely affect redband trout are unsound. Salient scientific information indicates that the additional sediment delivery generated by the action alternatives will adversely affect redband trout.

Rather than properly incorporating this information on fine sediment impacts on salmonids, the FSEIS (p. 236) incorrectly characterizes these findings by stating (emphasis added): "There are several pieces of literature (Suttle et al. 2004 and Bryce et al. 2010) that conclude any increase in fine sediment impairs steelhead (and similarly redband) growth and production or aquatic food webs. **However, these pieces of literature do not state that they may significantly impact steelhead growth and production or aquatic food webs."** But, here's what Suttle et al. (2004) actually states (emphasis added)

> "**The linear relationship between deposited fine sediment and juvenile steelhead growth suggests that there is no threshold below which exacerbation of fine-sediment delivery and storage in gravel bedded rivers will be harmless,…It is widely known that salmonid stocks decline when land use increases fine-sediment delivery to gravel-bedded rivers**…By confining juvenile steelhead over discreet patches of riverbed with experimentally imposed fine-sediment concentrations, we were able to investigate the **mechanisms underlying previously observed patterns of salmonid declines in response to fine-sediment loading and storage**… **The decreases in steelhead growth and survival we observed with increasing fine-sediment deposition were associated with lower prey availability and higher activity, aggression, and risk of injury. Declines in growth rates lower survival of salmonids and other fishes**…**Differences in growth and survival imposed by fine sediment could therefore have important population-level impacts**…**If land uses that increase loading or decrease transport of fine sediments continue unabated, however, areas of formerly suitable juvenile rearing habitat may be lost from the riverbed long enough to cause irreversible population declines in resident salmonids. This concern is particularly important for juvenile salmonids, whose territoriality limits their ability to crowd into shrinking areas of good habitat… Our experiment demonstrates that fine-sediment deposition, even at low concentrations, can decrease growth and survival of juvenile salmonids. We find**

[8] Notably, the FSEIS relied on information for relationships between steelhead and fine sediment levels in Stowell et al. (1983). This indicates that ONF considers the response of redband and steelhead trout to fine sediment levels to be similar. Therefore, the findings of Suttle et al. (2004) are applicable: any additional increment of added fine sediment will adversely affect the survival and production of redband trout.

> **no threshold below which fine-sediment addition is harmless**. **These results suggest that any augmentation of fine-sediment deposition in steelhead bearing rivers in this region will further impair this potentially population-limiting life stage…"**

Thus, the FSEIS grossly mischaracterized the findings of Suttle et al. (2004) and failed to properly incorporate it into the FSEIS analysis of the cumulative effects of the action alternatives on redband survival and production.

In contrast to the FSEIS's mischaracterization, Bryce et al. (2010) states:

> "**Sediment has long been recognized as a leading cause of biological impairment in rivers and streams of the US… Fine sediments affect fish food sources, growth rates, migration, and reproduction**…we focused on 4 sediment-sensitive fish species in the Mountains region—Chinook salmon (Oncorhynchus tshawytscha), bull trout (Salvelinus confluentus), rainbow trout (Oncorhynchus mykiss), and cutthroat trout (Oncorhynchus clarkii)—and a group of 8 sediment-sensitive aquatic macroinvertebrates … Reiser and White (1988) also tested the survival of newly fertilized Chinook salmon eggs …They found that declines in survival were delayed as fines were progressively added until % fines in the incubation gravel was 10% by volume, after which declines began and continued unabated. As injected sediments (0.85–4.6 mm) increased from 10 to 30%…survival declined from 63% to 25%... At reference (0%), low (4.6%), and medium (8.2%) levels of sediment, [rainbow trout] total emergence was between 85% and 90%. Emergence decreased to 78.5% when sediment was increased to 11.2% by volume. The sediment loadings also resulted in a number of nonemergent fry that were trapped beneath the sediment. **The numbers of nonemergent (trapped) fry were significantly greater (p , 0.05) at medium and high amounts of sediments (8.2% and 11.2%, respectively) than they were at low and reference levels**… **using our results for sand and fines, regional managers might propose a 13% criterion for sand and fines, but apply a more restrictive 11% criterion to critical spawning areas for the more sediment-sensitive bull trout or Chinook salmon… After evaluating the available information, we concluded that minimum-effect bedded surficial sediment levels for aquatic vertebrates (fish and amphibians) were 5% and 13%, respectively, for % fines (≤0.06 mm) and % sand and fines (≤2 mm)"**

Notably, these serious defects in the FSEIS persist despite information provided in comments on the FEIS demonstrating that the overall approach for assessing the cumulative sediment-related impacts on redband trout under the action alternatives was terminally defective. Instead of attempting to cure these defects, the FSEIS merely repeats them.

For these combined reasons, the FSEIS did not properly determine that the additional sediment delivery generated by the action alternatives will harm redband trout. As will be discussed, this caused the FSEIS to fail to properly determine that the action alternatives violate INFISH requirements.

THE FSEIS FAILED TO REASONABLY EXAMINE AND MAKE KNOWN THE VERY LIMITED EFFECTIVENESS OF BEST MANAGEMENT PRACTICES AND PROJECT DESIGN CRITERIA (PDC)

The state-of-the-art review of best management practices (BMPs) for roads done for the USEPA (GLEC, 2008) clearly concludes, based on a thorough examination of available scientific literature, that efforts to disconnect routes from streams are often ineffective in areas, particularly in areas with steep slopes and in close proximity to streams, particularly in the Pacific Northwest. It has long been known that it is not possible to eliminate greatly elevated sediment delivery and runoff impacts from routes at stream crossings (Kattelmann, 1996; Beschta et al., 2004; Rhodes and Frissell, 2015). Efforts to disconnect roads near streams are often ineffective, because as a thorough review of road BMP effectiveness (Great Lakes Environmental Center, 2008) concluded, location often trumps technique with respect to routes near streams.

The extensive analysis of sediment data by Klein et al. (2012) indicates that riparian protections and other BMPs are likely inadequate to eliminate sediment impacts from forest removal. The analysis indicated that the amount of forest removal elevated turbidity levels, which are an index of suspended sediment levels, despite modern BMPs (Klein et al., 2012). While these results were for areas dominated by rainfall, rather than snowmelt, they strongly indicate that BMPs do not eliminate sediment-related impacts of forest removal.

Notably, despite the FSEIS repeated assertions that BMPs and PDCs will minimize stream crossing impacts, the FSEIS is devoid of any scientific literature that supports this notion. It is long-established that the most effective way to minimize impacts from disturbance is to **avoid** locating disturbances in sensitive areas, such as RHCAs and stream crossings. The action alternatives do not do this.

While there is a considerable amount of scientific literature documenting the limited effectiveness of BMPs, the FSEIS steadfastly ignored this critically important information. In so doing, the FSEIS failed to reasonably assess and make known the impacts of the action alternatives on aquatic systems, including RMOs, redband trout, and water quality.

THE FSEIS FAILED TO PROPERLY DETERMINE THAT THE ACTION ALTERNATIVES VIOLATE INFISH REQUIREMENTS

The FSEIS did not reasonably determine that the action alternatives, including Alt. 5, do not avoid adverse impacts on redband trout, due to sediment-related impacts, which violates INFISH requirements.

As previously discussed, available information demonstrates that the increased sediment delivery under each of the action alternatives would harm redband trout. The FSEIS failed to properly assess these adverse impacts due to scientifically unsound assumptions combined with the failure to reasonably assess the cumulative impacts on sediment delivery.

Nonetheless, the FSEIS repeatedly acknowledges that the action alternatives would have significant negative effects on redband trout within the Project area. For instance, the FSEIS (p.

178) correctly notes that the consequences common to all action alternatives include: "Construction of culverts can increase sedimentation in streams that may reduce overall pool volume. Reducing pool volume for fish reduces hiding cover, resting and feeding areas and increases stream temperature. Construction of trails within the 300-foot sediment delivery zone would continue to deliver sediment into streams. In Class I and II streams, increased sediment would affect fish habitat by filling pools and increasing fine sediment affecting fish and frog reproduction success." Thus, the action alternatives would clearly harm redband trout.

The FSEIS (p. 222) notes that the effects of Alternative 5 would "…essentially be the same for aquatic species as described in each subwatershed under Alternative 2." The FSEIS (p. 187) notes that under Alternative 2 "Short-term sediment inputs from trail construction, especially at stream crossings, may have negative effects during construction when turbidity is high. These negative effects may include fish displacement during times of high turbidity, limited feeding, and possible mortality."

These acknowledged impacts are certainly both adverse and serious, clearly indicating that adverse impacts on redband trout have not been avoided under any of the action alternatives.

The adverse impacts of the action alternatives on redband trout directly conflict with INFISH standard RM-1 which unambiguously requires the **avoidance of adverse impacts of recreation activities and facilities on inland fish, including redband trout**. Notably, as discussed, salient scientific information, which was arbitrarily ignored in the FSEIS, indicates that the adverse impacts on redband trout under the action alternatives are likely to be far greater than acknowledged in the FSEIS.

The FSEIS did not reasonably determine that sediment delivery under the action alternatives, including Alt. 5, will retard attainment of the width/depth ratio RMO in INFISH, which violates INFISH requirements.

Although stream channel width/depth ratio RMO adopted in the FSEIS is not sound, many streams in the Project area still do not meet this RMO standard (pp. FSEIS, pp. 145- 178). Available scientific information clearly indicates that increases in sediment delivery retard recovery of width/depth ratio (See: review in Rhodes et al., 1994). There is no question that the action alternatives will elevate sediment delivery, as previously discussed. Therefore, the action alternatives will retard the recovery of width/depth ratios in affected streams, which is impermissible under INFISH standard RM-1. This standard requires that the operation and design of recreation facilities, including trails, do not retard attainment of RMOs.

The FSEIS did not reasonably determine that impacts of the action alternatives, including Alt. 5, will retard attainment of the INFISH water temperature RMO, which violates INFISH requirements.

The FSEIS fails to credibly assess how the proposed action alternatives cumulatively affect water temperatures and attainment of the water temperature RMO in INFISH. This is a serious defect because many of the affected streams within the Project area do not meet state water temperature standards (FSEIS, p. 145-178) or the INFISH RMO for water temperature and are so thoroughly

degraded with respect to water temperature that many are listed as water quality limited under the Clean Water Act. Rather than reasonably assess the impacts of the routes on water temperatures, the FSEIS only asserts that the removal of shade-providing vegetation will be minimal. This is extremely inadequate for several reasons.

First, the loss of stream shade inexorably contributes to stream warming and retards the attainment of the INFISH water temperature RMO. The loss of stream shading is inevitable at newly constructed stream crossings at locations that provide stream shade. It is also inevitable with newly constructed routes that are proximate to streams. These impacts not only remove stream shade, but prevent the recovery of vegetation that provides shade and, thus, contribute to the recovery of thoroughly degraded water temperatures in the Project area. Therefore, the numerous new stream crossings and routes in RHCAs proposed under the action alternatives, will contribute to exacerbating stream temperature problems and retard attainment of the INFISH water temperature RMO. Importantly, the stream crossings and routes in RHCAs have long term negative impacts on water temperatures RMO attainment because OHV routes permanently prevent the recovery of vegetation that can provide stream shading and contribute to the attainment of the water temperature RMO in INFISH. Therefore, the action alternatives plainly retard water temperature recovery and thereby violate INFISH standard RM-1, although the FSEIS fails to make known this obvious impact of the action alternatives.

Second, stream crossings and routes in riparian areas contribute to water temperatures elevation and retard INFISH water temperature RMO attainment in several other ways besides the loss of stream shading. Stream crossings elevate water temperature via warmed route runoff from summer rain events that is delivered at stream crossings and other points that are hydrologically connected to streams (National Research Council (NRC), 2008). Runoff from routes occurs in response to even small precipitation events and this runoff is heated by warm road surfaces during summer. Notably, this thermal pollution from routes occurs when streams are already warm due to seasonal effects, elevating the adverse impacts on salmonids (Rhodes et al., 1994; McCullough, 1999).

Routes also elevate water temperatures due to their effects on subsurface runoff, by preventing infiltration of precipitation and shunting it to streams as surface runoff, thereby reducing subsurface flows to streams. Subsurface flow contributions are typically cooler than streamflows and, are critical to moderation of summer high water temperatures (Rhodes et al., 1994, Pollock et al., 2009). Thus, routes proximate to streams contribute to water temperature elevation and retard attainment of the water temperature RMO.

As previously discussed, OHV routes under the action alternatives will elevate sediment delivery, which contributes to increases in stream width and width/depth ratio. It is well-documented that stream widening, even in the absence of shade loss, elevates summer water temperatures (Rhodes et al., 1994; Bartholow, 2000; Pollock et al., 2009; Beschta et al., 2013). The increased sediment delivery under the action alternatives will retard the recovery of stream width/depth ratios, which will contribute to retarding the attainment of the INFISH water temperature RMO, although this obvious impact is never made known in the FSEIS.

OHV routes located in riparian areas under the action alternatives impair the microclimatic functions of riparian areas, which help moderate water temperatures in streams (USFS et al., 1993). Therefore, these proposed routes would retard the attainment of the water temperature RMO in INFISH.

Research in multiple watersheds has verified that stream temperatures tend to increase with increasing density of routes and stream crossings (Nelitz et al., 2005). This is likely due to the combined impacts of routes and route crossings on water temperatures, including shade loss, subsurface flow disruption, channel widening, and warmed runoff contributions. The action alternatives all increase the number and density of stream crossings, which available information indicates will retard the attainment of the INFISH water temperature RMO.

For these combined reasons, the FSEIS failed to properly assess the action alternatives' effects on the attainment of the INFISH water temperature RMO. In so doing, the FSEIS also failed to properly determine that the combined effects of these alternatives will retard attainment of the water temperature RMO in direct conflict with INFISH standard RM-1.

The FSEIS did not properly determine that impacts of the action alternatives, including Alt. 5, will retard attainment of the INFISH large woody debris RMO, which violates INFISH requirements.

The FSEIS fails to acknowledge that the action alternatives would reduce large woody debris (LWD), especially in the long-term, by permanently impairing LWD recruitment from routes that cross streams and are in RHCAs. USFS researchers (Meredith et al., 2014) have documented this long-term impairment of LWD levels due to routes near streams in the Columbia basin, although this is completely ignored in the FSEIS.

The loss of LWD is an extremely long-term impact, lasting more than a century in areas where trees are able to grow back after removal (Rhodes et al., 1994; McIntosh et al., 2000). However, the loss of LWD from route construction is even more persistent, because trees that could ultimately be recruited to streams would not be able to begin to grow on the routes for as long as the routes exist. This long-term loss of LWD under the action alternative will retard attainment of the INFISH LWD RMO, although the FSEIS fails to make known this obvious impact.

The FSEIS's argument that such reductions have no effect because they localized and minimal is absurd. A local effect is still an effect that retards attainment of the LWD RMO. Such an effect is both easily measured and assessed. The counting of LWD is simple and straightforward. The FSEIS has no basis for the assumption that the effect would be minimal: the FSEIS is devoid of any quantitative assessment of the magnitude of the reduction of LWD recruitment under the action alternatives.

Regardless of the magnitude of the loss of LWD under the alternatives, the loss will inexorably retard the attainment of the INFISH LWD RMO and degrade wood levels in affected streams. Both impacts will be extremely persistent and irreversible. Therefore, the impacts of the action alternatives clearly retard the attainment of the INFISH LWD RMO in direct violation of INFISH standard RM-1.

The FSEIS failed to reasonably determine that impacts of the action alternatives, including Alt. 5, will retard attainment of the INFISH pool frequency RMO which violates INFISH requirements.

Studies have repeatedly shown that increased sediment delivery and the loss of LWD both contribute to the loss of pool frequency (USFS et al., 1993; Rhodes et al., 1994; McIntosh et al., 2000; Buffington et al., 2002). McIntosh et al. (2000) and USFS et al., (1993) noted that elevated sediment delivery and loss of LWD are the major causes of the documented loss of pool frequency in watersheds with logging, grazing, and roads. Meredith et al. (2014) documented that routes within about 280 feet of streams cause long-term LWD depletion and the action alternatives would include many routes within this distance. Thus, the action alternatives will contribute to pool loss by increasing sediment delivery and causing long-term loss of LWD. The FSEIS (p. 236) acknowledges that the action alternatives effects on sediment delivery could result in pool infilling by sediment, yet fail to address the obvious: this will retard attainment of the INFISH RMO for pools.

These impacts of the action alternatives will certainly retard the attainment of the pool RMO in INFISH, due to these alternatives' impacts on sediment delivery and LWD. As McIntosh et al.[9] (2000) clearly noted in their regional assessment of pool loss: "The restoration of pool habitats will take even longer to recover if management activities that forestall recovery remain the status quo (e.g., road construction, riparian timber harvest, and livestock grazing leading to degraded riparian vegetation, low recruitment of large woody debris, and increased sediment delivery)." This is clearly applicable to the action alternatives, which would construct and reconstruct routes in riparian areas, remove trees from riparian areas, degrade riparian vegetation, and reduce LWD recruitment in a persistent fashion, while elevating sediment delivery. Therefore, the action alternatives will retard attainment of the INFISH RMO for pools in direct conflict with INFISH standard RM-1.

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60-Day Notice of Intent to Sue

EXHIBIT A

Letter from Jonathan Rhodes, Hydrologist

Jonathan J. Rhodes
Hydrologist
2330 SE Taylor St •• Portland, OR 97214 •• 503.709.7007

April 28, 2022

Oliver Stiefel
Staff Attorney, Crag Law Center
3141 E Burnside Street
Portland, OR 97214

Re: Review and evaluation of how the removal of trees greater than 21" dbh will significantly and persistently harm aquatic systems on USFS lands east of the Cascades.

Dear Mr. Stiefel,

I am a hydrologist with more than 35 years of experience, with a B.S. in hydrology from University of Arizona, a M.S. in hydrology and hydrogeology from University of Nevada-Reno and I finished all required academic work toward a Ph.D. in forest hydrology at the University of Washington. Since 2001, I worked as a consulting hydrologist for a variety of clients, including county and tribal governments in Oregon, Washington, and Idaho. Prior to that I worked for more than 12.5 years at the Columbia River Inter-Tribal Fish Commission (CRITFC), where I served as Senior Scientist-Hydrologist. My professional experience includes work with tribal, federal, state, county, and city governments, universities, and non-profit groups in eight western states. A copy of my curriculum vitae is attached.

Most of my work has focused on the effects of current and proposed uses of land and water on water quality, streams and habitats for native trout and salmon. I am quite familiar with the management direction in PACFISH and INFISH, including how the USFS has implemented activities on its lands in Eastern Oregon and Washington. Our work at the CRITFC provided much of the foundation of PACFISH. I am also quite familiar with riparian and stream conditions on these USFS lands.

I have co-authored numerous papers on the effects of logging (including thinning), roads, and other activities on watersheds and aquatic systems published in peer-reviewed scholarly

journals. I've served as a peer-reviewer for scholarly forestry and fishery journals, including the North American Journal of Fisheries and the Open Forest Science Journal, as well as the Proceedings of Forest-Fish Conference: Land Management Affecting Aquatic Ecosystems.

My evaluation of how the removal of trees greater than 21" dbh will significantly and persistently harm aquatic systems on USFS lands east of the Cascades is based on my education and experience. It is also based on my considerable experience with forest removal activities on those lands implemented under PACFISH, INFISH and other USFS management direction. **The allowance to log larger trees in Inland USFS lands will cause significant long-term harm to already highly degraded aquatic systems and imperiled fish.**

There are several reasons that aquatic systems and imperiled fish will be harmed by the allowance to remove larger trees. Most significantly, this loss of larger trees will contribute to the loss of downed large woody debris (LWD) in streams and riparian habitats. This will persistently degrade fish habitats and riparian functionality.

The allowance for removal of larger trees is likely to occur within Riparian Habitat Conservation Areas (RHCAs) established under PACFISH and INFISH, based on my reviews of numerous forest removal activities (hereinafter: "logging") implemented in the more than two decades since the adoption of PACFISH and INFISH on numerous inland National Forests. These projects have commonly involved logging within designated RHCAs, despite the guidelines and standards contained in PACFISH and INFISH.

A significant number of these larger trees in RHCAs, if left unmolested by the depredation from logging, would ultimately be recruited into streams via various means (windthrow, bank erosion, death from old age, etc), providing instream LWD. Larger trees within a given distance from streams in RHCAs are more likely to land in streams other factors being equal. Notably, larger trees are farther along the trajectory to age-related mortality, which is a significant LWD recruitment factor.

The loss of larger trees in and near RHCAs also contributes to long-term LWD losses from adjacent trees in RHCAs. This is because, when larger trees fall, they often knock down other trees that provide LWD to streams and riparian areas. Thus, logging of larger trees is likely to ultimately reduce instream LWD in perennial streams via several means.

The removal of larger trees outside of RHCAs on non-fish-bearing non-perennial streams will also reduce LWD levels in these streams. This is because the widths of RHCAs along these streams are not adequate to retain unimpaired levels of LWD recruitment, even if all trees in these RHCAs are retained. The full retention of all trees within one site potential tree height from streams is required to ultimately provide unimpaired levels of LWD recruitment (Rhodes et al., 1994), but RHCA widths on non-perennial streams without fish are much narrower than that under PACFISH and INFISH.

The loss of LWD in streams is extremely significant for several reasons. LWD is vital to the survival and production of imperiled salmonids and the functionality of riparian ecosystems.

As we noted in Karr et al., (2004): "…there is no debate about the key role that large trees play in aquatic systems…"

LWD is the primary pool-forming element in salmonid habitats (Buffington et al., 2002; Pollock and Beechie, 2014). Pools, particularly, large, deep pools, are essential to salmonid production and survival. They provide essential refugia and rearing and resting habitats (McIntosh et al., 2002). Instream LWD provides cover, a vital aspect of pool quality affecting salmonid production and survival (Pollock and Beechie, 2014). It also aids in moderating water temperature (Pollock and Beechie, 2014).

The largest pieces of LWD, which can only come from larger trees, are the most effective agent of pool formation. Larger LWD pieces serve as critical anchors for LWD jams which are important pool forming agents (Buffington et al., 2002) that are particularly important to aquatic systems due to multiple benefits they convey (Pollok and Beechie, 2014). The effectiveness of LWD in pool formation tends to increase with the size of LWD (Buffington et al., 2002). These larger pieces of LWD also have the greatest longevity in stream channels and provide longer duration of instream functionality. Larger trees are older, thus, the recovery time from LWD lost due to logging increases as the size of tree logged increases. The loss of LWD is an extremely persistent impact, lasting more than a century in areas where trees are able to grow back after removal (Rhodes et al., 1994; McIntosh et al., 2000).

Loss of LWD from large tree logging negatively impacts salmonids. Available data indicate that salmonid production increases as LWD increases (Rhodes et al., 1994).

LWD loss contributes to the loss of pool quality, volume, and frequency (McIntosh et al., 2000; Pollock and Beechie, 2014). Salmonid numbers tend to increase with pool volume, quality, and frequency (Rhodes et al., 1994). Pool loss reduces the production capability of salmonid habitat (Rhodes et al., 1994). Thus, the loss of LWD from larger trees incurs long-term significant impacts on salmonids and their habitats (McIntosh et al., 2004; Pollock and Beechie, 2014). The loss of salmonid survival and production caused by loss of larger LWD in streams is not reversible and is irretrievable.

LWD aids in reducing channel erosion and buffering sediment inputs by providing sediment storage in headwater streams (Rhodes et al., 1994). This is an important function even in non-perennial streams because these streams comprise the vast majority of the stream network and provide most of the sediment to salmonid habitats.

LWD provides important sources of organic matter and nutrients in soils, which are vital to the long-term maintenance and protection of soil productivity (USFS and USBLM, 1997a; Karr et al., 2004). Soil productivity is critical to forest vegetation and a host of forest functions.

LWD in riparian areas aids in limiting stream damage from livestock grazing. This is not trivial, because livestock grazing is a major source of damage to salmonid habitats in the affected area (USFS and USBLM, 1997a; b). LWD helps to limit this damage by impeding livestock access to streams. The largest pieces of downed LWD in riparian areas provide the most effective impediment to livestock access to streams.

Any loss of LWD is significant due to its importance to stream habitats and salmonids coupled with their existing conditions. Pool loss in salmonid habitats has been extensive and severe over the past several decades in logged and roaded watersheds draining USFS lands in the interior Columbia basin (USFS and USBLM, 1997a; McIntosh et al., 2000). LWD loss has been a major contributing cause of this pool loss. The loss of pools and LWD has been repeatedly implicated as a significant factor in the widespread decline in the range and numbers of salmonid populations (Rhodes et al., 1994; McIntosh et al., 2000; Pollock and Beechie, 2014). Past logging and roading has greatly depleted existing LWD sources in many riparian areas throughout the affected region. This is extremely significant because one of most important roles of riparian forests with respect to aquatic biodiversity is production of LWD from large trees big enough to anchor wood jams and form pools (Pollock and Beechie, 2014). Instream LWD levels are widely depleted, and the allowance to log larger trees will exacerbate this long-term aquatic affliction. Salmonid populations throughout the affected area are imperiled (USFS and USBLM, 1997a). Additional degradation due to LWD loss contributes to the likelihood of increased extirpation of these populations and is inimical to the recovery of these salmonid populations. The time needed to recover from the loss of LWD caused by large tree logging is on the order of century or more. For these combined reasons, the loss of any sources of LWD from larger trees is ecologically significant.

It is extremely unlikely that the removal of larger trees in riparian areas would convey any potential benefits to aquatic systems. Logging in riparian areas under the rubric of "thinning" has been shown to reduce LWD (Pollock and Beechie, 2014). Similarly, such logging has been repeatedly shown to be highly unlikely to alter fire behavior, because it is extremely unlikely that fire will encounter treated areas during the short period of time that fuels have been temporarily reduced by treatments aimed at fuel reduction (Rhodes and Baker, 2008; Price et al., 2015).

My decades of experience with forest management activities on lands implemented under PACFISH and INFISH amply demonstrate that riparian logging has often been approved under the guise of restoring forest structure and/or fire behavior. While PACFISH and INFISH contain subjective direction that projects are not to retard or prevent attainment of riparian management objectives, in practice, this has not meant that that riparian logging is prohibited, or that negative impacts from such logging have not occurred. Instead, riparian logging activities approved under PACFISH and INFISH have frequently impacted aquatic ecosystem functions. This trend will continue, based on the track record of the USFS over the more than two decades since the adoption of PACFISH and INFISH. In my professional opinion, based on abundant scientific information, these impacts will be more severe and long-lasting now that large tree logging is allowed.

Please don't hesitate to contact me with any questions or follow-up related to any aspect of this work.

Sincerely,

Jonathan J. Rhodes
Hydrologist

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Curriculum Vitae: Jonathan J. Rhodes
Hydrologist

EDUCATION

1989: Doctoral candidacy degree in forest hydrology at the Univ. of Wash. Completed all requirements but dissertation.

1985: M.S. in Hydrology and Hydrogeology at the Univ. of Nev.-Reno. Thesis topic: The influence of seasonal stream runoff patterns on water quality.

1981: B.S. in Hydrology and Water Resources at the Univ. of Ariz.

PROFESSIONAL HISTORY

Sept. 2001 -- present. Principal Hydrologist, Planeto Azul Hydrology. Main duties: Analysis of water and land use effects on streams and aquatic resources, including native salmonids and their habitats; diagnosis of watershed and stream conditions; stream monitoring; development of programmatic and site-specific watershed and stream protection measures; project management. Some projects (and clients): Analysis of potential effects of groundwater pumping on streamflow (Conf. Tribes of the Umatilla Indian Reservation, OR); diagnosis of watershed and stream conditions in an urbanized watershed (West Multnomah Soil and Water Conservation District, OR); analysis of data on sediment effects on ESA-listed salmon in the South Fork Stillaguamish River, WA (Snohomish County, WA).

Aug. 1990 -- Sept. 2001. Consulting hydrologist for non-profit organizations. Past projects (and clients) include: hydrologic characterization of remnant marsh proposed as urban wildlife refuge/greenspace (Multnomah Co. Parks Dept, OR); review of aquatic effects of: quarry expansion (Friends of Forest Park, OR), urban construction (homeowners consortium, W. Linn, OR); forest manipulations on streamflow (Pacific Rivers Council).

Apr. 1989 -- Sept. 2001. Senior Fishery Scientist-Hydrologist, Columbia River Inter-Tribal Fish Commission. Main duties: Administration and implementation of projects monitoring channel change from land use; development of programmatic and site-specific land management plans to ensure protection of watershed integrity, water quality and aquatic resources; development of restoration plans for watersheds degraded by grazing, roads, logging, and mining; design of plans for monitoring watershed and stream erosion, sedimentation, water quality, and habitat conditions; review of land management plans for adequacy of protection of aquatic resources; field evaluation of watershed and channel conditions throughout the Columbia Basin; expert witness testimony; development of technical recommendations for policy staff for protection of natal habitat for anadromous fish; review of state and federal aquatic resource monitoring plans; report and proposal writing; and, participation in various state and federal technical work groups.

Aug. '84 -- Apr. '89. Research assistant, College of Forestry, Univ. of Wash. Main duties: analysis and interpretation of water quality-quantity data; technical report writing; design and maintenance of water chemistry and quantity monitoring network in a coastal forested watershed; training in data acquisition techniques; public presentation of findings.

July -- Oct. 1987 and May -- Oct. 1988. Consulting hydrologist, Tahoe Regional Planning Association, CA and NV. Main duties: field delineation and mapping of riparian zones, wetlands, and erosion-prone areas.

June -- Sept. 1985 and July 1986. Research assistant, Dept. of Geophysics, Univ of Wash. Main duties: operation of field station for glacier research on Mt. Olympus, Wash.; measurement of snow and glacier melt rates; mapping of supra- and extra- glacial streams contributing to basal sub-glacial flow rates on surging and non-surging glaciers in the Alaska Range, Alaska.

Jan. 1984. Consultant with C.M. Skau, Reno, NV. Main duties: field evaluation of logging roads for erosion potential and sedimentation risk; recommendations for placement of future roads to minimize erosion and sediment delivery to fish-bearing streams in coastal Northern California.

Oct. 1983 -- June 1984. Hydrologic Tech., USGS, Carson City, NV. Main duties: aid in development and calibration of predictive water quality model for the Truckee River; statistical analysis of water quality data; identification and quantification of non-point sources of nutrients to Truckee River, NV.

Aug. 1981 -- Sept. 1983. Research Assistant, Univ. of Nev.-Reno. Main duties: design and installation of instrument network to monitor water chemistry and quantity in a small, forested alpine watershed in the Sierra Nevada; water quality sampling; data interpretation and management; preparation of reports, grant proposals, and publications, computer programming for data reduction and storage; mapping of geology, soils and runoff-producing areas; and, training of field technicians.

Feb. -- May 1981. Water Quality Intern, Pima Assoc. of Gov'ts., Tucson, AZ. Main duties: water quality sampling of agricultural production wells; mapping of groundwater levels; and, coordination of sampling efforts.

PROFESSIONAL SERVICE

May 2009 – present. Peer Reviewer for the scholarly journal, Open Forest Science Journal, for papers related to hydrology and forest and watershed responses to disturbance.

Feb. 2010. Invited Guest Lecturer, Lewis and Clark School of Law course on public lands law:
"PACFISH and INFISH and Imperiled Salmonids on Public Lands" Portland, OR.

Feb. 2009. Invited Guest Lecturer, Lewis and Clark School of Law course on public lands law:
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Feb. 2008. Invited Guest Lecturer, Lewis and Clark School of Law course on public lands law:
"PACFISH and INFISH and Imperiled Salmonids on Public Lands" Portland, OR.

Mar. 2007. Invited Panel Speaker, International Environmental Law Conference: "Fuel Treatments & Thinning: Its Impacts and Low Priority Relative to Other Needed Restoration Measures," Univ. of OR, Eugene, OR.

Mar. 2007. Invited Panel Speaker, International Environmental Law Conference: "The Impacts of Livestock Grazing on Water Quality and Trout Habitats," Univ. of OR, Eugene, OR.

Feb. 2005. Invited Guest Lecturer, Lewis and Clark School of Law course on public lands law:
"Postfire Watershed Management on Western Public Lands" Portland, OR.

Mar. 2004. Invited Panel Speaker, International Environmental Law Conference: "Postfire Watershed Restoration," Univ. of OR, Eugene, OR.

April 2002. Invited Speaker, Restoring Public Lands Conference: Reclaiming the Concept of Forest Restoration, "Watersheds and Fisheries: Restoration Needs for Trout Habitats," Univ. of CO, Boulder, CO

Mar 2002. Invited Panel Speaker, International Environmental Law Conference: "Soils, Impacts and Effects on Trout Habitat," Univ. of OR, Eugene, OR

Mar. 2001. Invited Panel Speaker, International Environmental Law Conference: "NFMA and Salmon Habitat Protection," Univ. of OR, Eugene, OR.

May 2000. Invited speaker, 5th National Tribal Conf. on Environmental Management: "Federal Land Management's Effects on Critical Habitat for Endangered Salmon," Lincoln City, OR

July 1998-2000. Peer Reviewer for the scholarly journal, N. Amer. J. Fish, for papers related to the sedimentation of fish habitat in response to erosion from land uses and fire.

Feb. 1998. Invited Speaker, Oregon AFS Annual meeting: "Adaptive management: Is it really adaptive?" Sunriver, OR

May 1996-2000. Guest lecturer, Oregon State Univ. graduate course on riparian and wetland ecology, Corvallis, OR

Apr.-May 1996. Peer-reviewer for Proceedings of Forest-Fish Conference: Land Management Affecting Aquatic Ecosystems, Proc. Forest-Fish Conf., May 1-4, 1996, Calgary, Alberta, Canada. Nat. Resour. Can., Can. For. Serv. Nort. For. Cent., Edmonton, Alberta. Inf. Rep. NOR-X-356.

Apr. 1995. Invited speaker, Pacific Rivers Council Workshop on Watershed Analysis and Salvage Logging, Wenatchee, Wash.

Apr. 1995. Invited speaker, Oregon State Univ. Dept of Fisheries and Wildlife Seminar, Corvallis, OR

Apr. 1995. Invited speaker, American Fisheries Society North Pacific International Chapter, Annual Meeting, Vancouver B.C., Can.

Mar. 1995. Invited speaker, American Fisheries Society Idaho Chapter Annual Meeting, Boise, ID.

Nov. 1994. Invited speaker, President's Council on Sustainable Development Workshop, Yakima, WA.

Sept. 1994. Invited speaker, Oregon Water Resources Research Institute Streambank Restoration Conference: "Biological Methods to Stabilize Streambanks--From Theory to Practice," Portland, OR.

Mar.-April, 1994. Peer-reviewer for Henjum et al., 1994. Interim Protection for Late Successional Forests, Fisheries, and Watersheds: National Forests East of The Cascade Crest, Oregon and Washington. The Wildlife Soc., Bethesda, MD.

Jan. 1993-Sept. 1995. Member, Oregon Department of Environmental Quality's (ODEQ) Technical Advisory Committee for Triennial Review of the State Water Temperature Standard.

Mar. 1993. Invited speaker, Northwest Scientific Association Symposium: "Cumulative Effects of Land

Management Practices on Anadromous Salmonids," La Grande, OR.

Aug. 1992 - Sept. 1992. Member, Ad Hoc Consultant Selection Committee for Portland Water Bureau Study of Future Water Supply Needs.

May 1992. Invited Speaker, US Forest Service, Pacific Northwest Region, Regional Workshop on Monitoring Soil and Water Resources, Bend, OR.

May 1992. Invited Speaker, Northern Arizona University, School of Forestry, Graduate Seminar Series, Flagstaff, AZ.

Jan. 1991 - Mar. 1995. Member, Technical Work Group: Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration and Monitoring Plan.

Aug. 1989 - Feb. 1990. Member, Technical Advisory Committee to ODEQ for development of definitions for level of beneficial use impairment by nonpoint sources.

May 1989 - Jan. 1991.Member, Nonpoint Source Technical Advisory Committee to Idaho Department of Environmental Quality: Coordinated Nonpoint Source Monitoring Program For Idaho.

PUBLICATIONS
Peer-Reviewed:

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1995. Wildfire and Salvage Logging: Recommendations for Ecologically Sound Post-Fire Salvage Logging and Other Post-Fire Treatments on Federal Lands in the West. Pacific Rivers Council, Portland, OR (Co-authors: R. Beschta, C. Frissell, R. Gresswell, R. Hauer, J. Karr, G. Minshall, D. Perry).

1998. Adaptive management: Is it really adaptive? Abstracts: Oregon AFS Annual Meeting, Feb. 11-13, 1998, p. 31.

1998. Thinning For Increased Water Yield in the Sierra Nevada: Free Lunch or Pie in the Sky? Pacific Rivers Council, Eugene, OR. (Co-author: M. Purser)

1999. Annual Project Report: Watershed Evaluation and Aquatic Habitat Response to Recent Storms. Bonneville Power Administration (BPA), Portland, OR. (Co-author: C. Huntington)

1999. Annual Project Report: Monitoring Fine Sediment in Salmon Habitat in John Day and Grande Ronde Rivers. BPA, Portland, OR (Co-author: M. Purser)

2000. Annual Project Report: Watershed Evaluation and Aquatic Habitat Response to Recent Storms. BPA, Portland, OR. (Co-author: C. Huntington)

2000. Annual Project Report: Monitoring Fine Sediment in Salmon Habitat in John Day and Grande Ronde Rivers. (Co-author: M. J. Greene)

2001. Annual Project Report: Monitoring Fine Sediment in Salmon Habitat in John Day and Grande Ronde Rivers. BPA, Portland, OR. (Co-author: M. J. Greene)

2001. Imperiled Western Trout and the Importance of Roadless Areas. Western Native Trout Campaign, Center for Biological Diversity, Tucson, Az. (Co-authors: J. Kessler, C. Bradley, and J. Wood)

2002. Tryon Creek Watershed: Overview of Existing Conditions, Data Gaps, and Recommendations for the Protection and Restoration of Aquatic Resources. West Multnomah Soil and Water Conservation District, Portland, OR

2002. An Analysis of Trout and Salmon Status and Conservation Values of Potential Wilderness Candidates in Idaho and Eastern Washington. Western Native Trout Campaign, Center for Biological Diversity, Tucson, AZ. (Co-authors: C. Bradley, J. Kessler, C. Frissell)

2003. Stream and Fish Habitat Conditions in Tryon Creek: Their Likely Causes and Ramifications for Salmonids. Proceedings of Urban Ecology and Conservation Symposium, January 24, 2003, Portland, OR. Portland State University, Environmental Sciences and Resources, Portland, OR

2008. Primary Sources of Fine Sediment in the South Fork Stillaguamish River. Interim progress report for Washington State Salmon Recovery Funding Board, Olympia, WA. Snohomish County Public Works Surface Water Management, Everett, WA. (Co-authors: M. Purser, B. Gaddis, S. Britton, T. Coburn, and M. Rustay)

2009. Primary Sources of Fine Sediment in the South Fork Stillaguamish River. Project completion report for Washington State Salmon Recovery Funding Board, Olympia, WA. Snohomish County Public Works Surface Water Management, Everett, WA. (Co-authors: M. Purser, B. Gaddis)

2015. The High Costs and Low Benefits of Attempting to Increase Water Yield by Forest Removal in the Sierra Nevada. 108 pp. Environment Now, 12400 Wilshire Blvd, Suite 650, Los Angeles, CA 90025. (Co-author: CA. Frissell)

Semi-Technical Publications:

1993. Dam the analysis--heal streams instead. The Assoc. of Forest Service Employees for Env. Ethics Inner Voice, **5**(6): 1, 4-5.

1994. Invited Preface to Northwest Science Special Issue--Environmental History of River Basins in Eastern Oregon and Washington. Northwest Sci., **68**.

PROJECT MANAGEMENT

1993-1996. Technical Assistance Contract with NMFS to produce technical guidance for ESA consultations for effects of land management on critical habitat for Columbia basin salmon. Main duties: Primary Investigator; primary author of peer-reviewed reports including proposed guidelines for salmon habitat effects assessment (Rhodes et al., 1994), evaluation of land management plans' protection of critical salmon habitat (Rhodes, 1995), and evaluation of models for estimating land management effects on salmon habitat (Rhodes, 1996); available scientific literature review; budget tracking; project coordination. Total budget: $230,000.

1998-2000. Watershed Evaluation and Aquatic Habitat Response to Recent Storms. Main duties: Primary Investigator; design and implementation of monitoring methods, coordination of technical staff in 10 watersheds with differing levels of grazing and logging in 3 subbasins in Idaho, Washington, and Oregon; technical training; data analysis; contract administration; proposal development; report preparation; budget development and tracking; coordination with grantor representatives. Total budget: $164,000.

1998-2000. Evaluation of Effects of Grazing on Rate of Salmon Habitat Recovery. Main duties: Primary Investigator; design and implementation of monitoring methods, training of field technician; data analysis and synthesis; proposal development; preparation of progress reports; budget development and tracking; coordination with grantor representatives. Total budget: $73,000.

1998-2001. Monitoring Fine Sediment Levels in Salmon Habitat in Grande Ronde and John Day Rivers. Main duties: Primary Investigator; design and implementation of methods for monitoring fine sediment levels in four rivers; field technician training; data analysis and synthesis; subcontract administration; proposal development; progress and technical report preparation; budget development and tracking; coordination with grantor representatives. Total budget: $128,000.

2001-2002. Western Native Trout Campaign, Aquatic Scientist and Coordinator. Main duties: Oversight and assurance of scientific integrity of all reports and work products; coordinate conservation efforts among campaign member organizations and other groups working to protect and restore trout habitats and populations; budget tracking; technical and progress report preparation.

HONORS AND AWARDS

1996. Leadership and Excellence. Col. River Inter-Tribal Fish Comm., Portland, OR

1991. Employee of the Year. Col. River Inter-Tribal Fish Comm., Portland, OR

1984. Academic Recruitment Scholarship for Outstanding Graduate Prospect. Univ. of Wash, Seattle, Wash.

1982. Maxey Award -- Outstanding Graduate Student Paper in Hydrology. Univ. of Nev.-Reno.

1980. Winslow and Myron Reuben Scholarship for Outstanding Undergraduate in the Earth Sciences. Univ. of Ariz., Tucson, Az.

ADDITIONAL TRAINING

1993. USFWS Water Temperature Modeling via SNTEMP

1991. USFWS Introduction to IFIM Investigations

October 27, 2016

Paul Dewey
Central Oregon Landwatch
50 SW Bond Street, Suite 4
Bend, Oregon 97702

Re: Review and Comment on the 2009 Scoping Letter, 2013 Draft Environmental Impact Statement (DEIS), 2014 Final Environmental Impact Statement (FEIS), April 2016 Supplemental DEIS (SDEIS), September 2016 Supplemental Final EIS (SFEIS) and Draft Record of Decision (ROD) for the Ochoco National Forest (ONF) proposed Ochoco Summit Trail System Project (Project) and Forest Plan Amendments.

Dear Mr. Dewey,

I have reviewed all Project documents for the proposed Ochoco Summit Trail System, numerous other documents available on the USDA Forest Service (Forest Service) website, and Project documents from the Ochoco National Forest (ONF) along with relevant research and literature. Below are my comments on the ONF Summit Trail System Project regarding the planning, analysis and conclusions of the ONF.

I am a wildlife biologist with over 34 years of experience, including 25 years with the Forest Service, 5 years with the Oregon Department of Fish and Wildlife (ODFW), and 4 years as a consulting terrestrial resource specialist with the Forest Service. Much of my work for the Forest Service was spent in central Oregon on the Deschutes National Forest and as a hydropower program terrestrial biologist for many projects east of the Cascade Mountains. I also recreate extensively in the proposed Summit Trail System Project area for camping, hiking, fishing, hunting and mountain biking. I have authored numerous documents on wildlife species and their habitats while working with the Forest Service, and impacts of Project developments on those species. Attached is my resume.

Wildlife Habitat Primer:

Wildlife species require a variety of habitat types by season to meet basic needs of food, water, shelter, and space. Habitat quality is dependent on a habitat's structural components in conjunction with an environment where those structural components can function. In other words the structural components that provide adequate food, water, shelter and space are needed in time and space relatively free of disturbance. Functional habitat needs to be of adequate size and arrangement on the landscape to meet an animal's requirement for any particular season, such as breeding, wintering, calving, lactating/rearing, summering, and migration.

For example, in the Project Wildlife report (p. 45): elk calving structural components are described as: "*Aspen stands and wet meadow complexes interspersed in coniferous cover and riparian woodlands serve as calving grounds...*" These components are sought out by elk to birth their calves. However, without the habitat being functional and relatively free of disturbance, elk use of this habitat will be diminished or negated. For example, the noise of motor vehicles is a disturbance that affects the functional quality of wildlife habitat. As a general rule one can get a snapshot of noise disturbance by looking at its intensity (decibel level), frequency (number of times per hour), and duration (the length of time the disturbance lasts before conditions return to normal). For a more complete understanding of wildlife and human

disturbance see Chapter 7. Monitoring Human Disturbance for Management of Wildlife Species and Their Habitats in USDA Forest Service GTR WO-89 2013 (Rowland and Vojta 2013).

A summary of motorized impacts to wildlife and their habitat also is included in the Wildlife Section Chapter 3 of the 2011 FEIS for the Travel Management Project Deschutes National Forest Ochoco National Forest Crooked River National Grasslands (2011 Travel Management FEIS) and SFEIS (p. 243-247). The summary in the Travel Management Plan looks at general information about traffic/ road and landscape influences, species behavior and ecology, amphibian/ reptiles, carnivores, road construction, road disturbance, decreased sensitivity to sound, communication confusion, physiological effects, stress, habitat loss, access for predators, connectivity, permeability, and fragmentation, followed by species specific information (2011 Travel Management FEIS p. 302-311).

Following is my biological review of the Project.

1. The ONF Fails to Show Impacts to Wildlife Species and Habitats.

1A. Rocky Mountain Elk Calving and Elk Wallow-Habitat

The ONF fails to document how it minimized Project effects to Rocky Mountain elk calving areas and elk wallows during the LRMP restriction period. The ONF LRMP Wildlife and Fish – Forest-wide Standards and Guidelines for Rocky Mountain Elk and Mule Deer (LRMP 4-246) state "Protect the character of elk calving sites. Minimize disturbance from human activity during calving season (approximately May 15 to June 30). Also protect wallows during rutting season (September 1 to October 15)."

Elk calving and wallow habitat are important to ensure the reproductive viability of the local elk populations (Oregon Forest Resources Institute (OFRI) 2013; Washington Department of Fish and Wildlife (WDFW) 2005). Elk calving (and deer fawning) areas, with low disturbance, are needed for birthing to ensure population recruitment. Lehman et al. (2015) found that "At the fine scale in forests and grasslands, female elk selected sites in areas with intermediate slope (19%), closer to water (355–610 meters), and far from roads (541–791 meters)". Likewise, bull elk create and use wallows, with low disturbance, to cover themselves in mud laced with their urine and feces (their perfume) to attract and breed with cow elk in the fall of the year. Both life history functions breeding and reproduction are essential to the health, productivity and vitality of an elk herd.

All action alternatives in the SFEIS place OHV trails in close proximity to elk calving and deer fawning habitat during the Ochoco Forest Land and Resource Management Plan (LRMP) restriction period. Impacts range from 44.5 miles to 70.4 miles of trail not on open roads (SFEIS Table 146, p. 309) and impact between 7,120 to 11,264 acres of effective calving and fawning habitat (SFEIS p. 305). The SFEIS (p. 305) assumes a reduction in effective habitat of 200 meters (approximately .25 miles) on each side of a trail (160 acres per mile). None of the action alternatives address impacts to elk wallows by OHV riders.

Phillips and Alldredge (2000) studied reproductive success of elk following disturbance by humans during calving season and showed that with only 10 disturbance periods above ambient noise levels, their model showed no recruitment. The Summit Project, if implemented with any of the action alternatives, has the ability to significantly affect the ODFW Ochoco management unit elk population objectives. The

LRMP cites the Ochoco management unit elk management objective as 2600. In 2004-2005, the ONF persuaded ODFW to increase the elk population objectives to 4500. Population trends show that elk numbers and elk harvest are decreasing (Figure 1). (Greg Jackle, ODFW district wildlife biologist, pers. comm.).

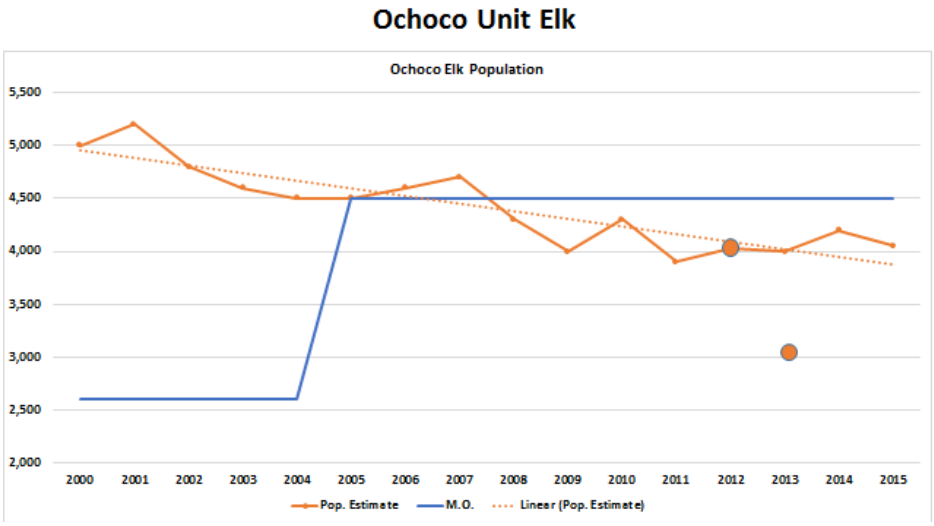

Figure 1. Ochoco Management Unit elk population estimates, 2000-2015. The orange line is the annual population estimate for elk while the "management objective" (MO) is the blue line (data from Greg Jackle, ODFW District Wildlife Biologist, pers. comm.). The MO was raised at the request of the forest in a public process.

All action alternatives propose a trail-riding season ranging from May 1 through November 1 of each year for alternatives 2 and 4, and June 1 through September 30 of each year for Alternatives 3 and 5. All of the action alternatives will impact elk calving during the months of May-June and elk wallows used for breeding during the months of September-October. Even the shorter proposed seasons of motorized recreational use for action alternatives 3 and 5 will impact the months of June and September each year.

The only recommended action by the ONF is to restrict "project construction, re-construction, decommissioning and maintenance activities from May 15 through June 30 with elk calving areas…and restrict project construction, re-construction, decommissioning and maintenance activities from September 1 through October 15 within 0.25 mile of known elk wallows" (SFEIS p.36). The ONF did not implement measures to protect these sensitive habitats during the allowed season of use for general riding by OHV recreationists.

1B. Elk Security Habitat

Elk occupy a mix of open areas for feeding and need both hiding and thermal cover (ODFW 2003). Hiding cover or security habitat is essential for protection from predators and human disturbance (ODFW 2003; WDFW 2005, Wyoming Game & Fish Bulletin 27). Security cover may consist of thick brush, conifers or heavy timber, and topography that allow them to hide. Lack of security cover and disturbance may force elk away from critical areas or stress animals. Cover also is used in extreme weather, to avoid hunters or other human disturbances, and conceal newborn calves from predators.

Elk security habitat is composed of structural and functional cover such as thick timber that an elk will seek out to hide from perceived threats (ODFW 2003). Oregon's principal elk ranges lack the large blocks of unroaded wilderness that are present in other western states. The farther an elk has to travel from security habitat to obtain food, the less those needs are met and the habitat may not be used, depending on the level and degree of potential threats. Where there are few threats, such as in National Parks, elk are often seen in the open; while areas of greater threats such as national forests where there are frequent disturbance from roads or recreational activities or poaching is common, elk stay close to security cover. The arrangement of security habitat with foraging habitat along with the amount of disturbance generally defines the area of functional foraging habitat. For example, adequate forage quantity and quality is necessary for a lactating cow to feed herself and her newborn calf. The amount of disturbance she is subject to affects how far she will travel from security habitat to forage, and may affect her and her calf's nutritional needs.

Many studies have demonstrated the huge effect that roads and motorized OHVs have on elk (Lyon 1979; Gaines et al. 2003; Rowland et al. 2000, 2005; Wisdom et al. 2005, 2006; McCorquodale et al. 2010; McCorquodale 2013; Proffitt et al. 2012; Ranglack et al. 2014). Rowland et al. (2005) described numerous effects of motorized vehicles on elk. These ranged from direct impacts to individual animals and populations such as increased vulnerability to harvest from legal and illegal hunting and vehicle collisions. The largest impact is the indirect impact caused by fragmentation of habitat with heavily roaded areas leaving too few areas for animals to escape, and displacement or avoidance, leaving less functional habitat for elk to use. Roads have been documented to cause reduced habitat availability and carrying capacity, movement of elk from public to private lands, abandonment of entire herd ranges when roads exceed some threshold, higher stress levels and increased energetic costs that reduce productivity (Millspaugh et al. 2001), and reduced local and regional populations (Forman et al. 2003). Increasing growth of motorized and non-motorized recreational pursuits is believed by state elk managers to threaten some herds and have contributed to shifts of elk from some public lands onto adjacent private lands (ODFW 2003).

According to the SFEIS (p. 284), the 301,580 acre Project area provides both summer and winter range habitat for mule deer and Rocky Mountain elk. Within the project area there are 17,828 acres in Winter Range, 25,183 acres in General Forest Winter Range, and 195,735 acres in General Forest (summer range) allocations, so the approximately 65% of the Project area is summer range. The higher elevations in the Ochoco Summit project area become snowbound in the winter and deer [and elk] are known to concentrate in foothills and valley bottoms along the Crooked and John Day Rivers and their tributaries during the winter (SFEIS p. 285). Both mule deer and elk are listed as Management Indicator Species for the Ochoco National Forest and elk in particular can act as a barometer for species sensitive to human disturbance. The Forest Plan provides habitat management direction for big game animals (SFEIS p.287).

The analyses by the ONF defined elk security habitat (SFEIS p.287) as forested habitat at least 250 acres in size and at least ½ mile from any motorized route. (See Item 2 below regarding motorized route density) The SFEIS used distance banding to describe open road effects to big game. Included in the distance banding analysis was the defined elk security habitat. Table 144 (SFEIS p. 296) shows acres of elk security area greater than ½ mile from open motorized routes for the no action and all action alternatives by 5th field watersheds.

Table 144 (SFEIS p. 296) shows a decrease in elk security habitat acres for all action alternatives in each of the 9 - 5th field watersheds. The following table (Table 1) is another way to show the data displayed in Table 144 in the SFEIS.

Table 1. Change in elk security habitat by watershed and action alternative.

5th Field Watershed	Watershed Acres (ONF)	Current Elk Security % (Acres)	Alternative 2 % / (acres) Impacted	Alternative 3 % / (acres) Impacted	Alternative 4 % / (acres) Impacted	Alternative 5 % / (acres) impacted
Bridge Creek	15,595	27.4% (4,274)	0.3% (14)	0.3% (14)	0.3% (14)	0.3% (14)
Deep Creek	54,561	6.9% (3,745)	**90.0% (3,367)**	**73.7% (2,721)**	**99.9% (3,744)**	**73.5% (2,753)**
Lower Beaver Cr	23,611	17.6% (4,176)	18.1% (754)	18.1% (754)	18.1% (754)	17.6% (733)
Lower NF Crooked R	21,458	22.6% (4,868)	5.6% (275)	5.6% (275)	5.6% (275)	5.9% (285)
Mountain Creek	19,244	36.3% (6,986)	0.4% (27)	0	0.4% (27)	0.1% (9)
Paulina Creek	16,093	10.0% (1,609)	0.4% (7)	0.4% (7)	0.4% (7)	0.5% (9)
Rock Creek	14,181	24.4% (3,466)	1.6% (57)	1.6% (57)	1.6% (57)	1.7% (59)
Upper NF Crooked R	89,005	10.6% (9,433)	3.5% (329)	3.4% (325)	3.9% (366)	3.5% (331)
Upper Ochoco Creek	47,832	19.7% (9,412)	7.2% (678)	13.9% (1,304)	17.0% (1,593)	14.3% (1,346)
Total Project Area	301,580	15.9% (47,969)	11.5% (5,509)	11.4% (5,455)	13.6% (6,537)	11.5% (5,538)

* The estimate for Lower NF Crooked River watershed is misleading since there are no OHV trails in this watershed.

Table 1 and the SFEIS (Table 144) show significant elk security habitat impacts to the Deep Creek 5th field watershed from the proposed OHV trail system. Much of the Deep Creek watershed is comprised of stringer stands of timber in the bottom of canyons along streams and open ridge areas of shrub scablands. Even without the road system, the area was historically comprised of open ridges with most hiding cover associated with timber stands along stream bottoms. Much of the forest road system was developed for timber harvest in the 1960s and 1970s (SFEIS p. 119). The SFEIS (p. 56) reported that "*The majority of roads within the project area have been in existence for more than 40 years*". Since much of the timber in the eastern portion of the forest occurred in stream bottoms, there are high road densities in the subwatersheds along streams where timber was extracted for wood products. Since that's where the hiding cover is primarily located, these roads have impacted elk security habitat.

With the existing road system of open roads that were developed for timber harvest, less than 7% elk security habitat remains in the 54,561-acre watershed in the No Action Alternative. The

"Environmentally Preferable Alternative" (Alternative 5 plus portions of Alternative 2) impacts are not available, as the ONF did not provide any environmental analysis on its selected alternative. However, Alternative 5, which represents the majority of the "Environmentally Preferable Alternative", leaves only 992 acres (1.8%) of elk security habitat left in this 54,561 acre watershed. The watershed had little elk security habitat left because of roads and past timber harvest, and with the addition of the OHV trail it removes 73.5% of the remaining elk security habitat that is greater than 250 acres in the Deep Creek watershed. This estimate also underestimates the real impact because it only includes the open road density, and does not account for closed (ML 1), decommissioned, and temporary roads, and user-created OHV trails. So, the situation is even more ominous than the analysis shows.

The Deep Creek watershed is in the heart of the Ochoco Mountains and is key summer range for elk populations. ODFW conducted an elk telemetry study starting in 1989 (ODFW 1998). A total of 39 elk were radio-collared and monitored until June 1994. Nineteen elk were captured in the Deep Planning Area and both elk (and uncollared deer) were recorded using the area during the snow free months (summarized in the Deep Vegetation Management Project, DEIS April 2001). In winter, animals moved to lower elevations generally either north of the district, east toward the South Fork of the John Day River, or south to the Crooked River valley. Locations of elk during the calving season in the Deep watershed were associated with riparian areas. Wildlife surveys in the Deep Vegetation Management Planning area recorded sightings of calves along riparian areas in the northern part. While specific sites of wallows were not recorded, they were thought to be present in the Deep Creek watershed and were associated with seeps, springs and other riparian habitats.

In a letter to the ONF on December 8, 2009 regarding the Travel Management DEIS (2011 Travel Management Plan FEIS, Appendix E Letters from Agencies, p. 488-497), ODFW noted a substantial increase in big game damage complaints from private landowners in the Ochoco Wildlife district between 1989 and 2008 from 7 to 55 complaints, respectively, and that elk had moved off of Forest lands and damage had increased considerably on private lands. The letter further noted that local research by ODFW in central Oregon had shown that illegal harvest of deer was greater than the legal harvest of deer during the regulated season. Because most of the illegally harvested deer were does, the problem was compounded since does are the recruitment component of the herd. Most poached collared deer were harvested within 300 meters of a road based on estimations by the biologists retrieving the collars. The Department requested in the letter that the ONF leave higher levels of hiding cover and close roads to provide more security to big game from poachers and other motorized disturbance.

The conflict essentially continues today because roads are left open and vegetation projects are implemented and continue to reduce hiding cover for big game. The 2004 Deep Vegetation Management Final Supplemental EIS (FSEIS) decision, which encompassed the entire Deep Creek watershed, was to implement Alternative C. That alternative includes 6393 acres of commercial timber harvest, 10,042 acres of precommercial thinning, and 8741 acres of prescribed burning outside of the treatment areas for a total of 25,176 acres. The Deep Creek FEIS Alternative C has/will treat 46% of the watershed.

Central Oregon Landwatch, per a Freedom of Information Request, asked the ONF for the GIS base layers and action alternative layers for the Summit OHV trail Project and information on vegetation and fuels treatment projects in the Project area in order to conduct their own analyses. Most of the

information was not supplied but there was one piece of information about elk security habitat for Alternative 5 that was provided that was relevant for Project impacts.

The following 2 figures are the Deep Creek watershed. Figure 2 depicts the harvest and precommercial treatment areas for the Deep Vegetation project (FEIS 2004). Figure 3 is from the GIS layers received in response to the FOIA request from Landwatch and depicts the remaining elk security cover for Alternative 5 and they are all areas with elk security habitat, not just the 250 acre "elk security habitat" areas defined in the Summit SFEIS.

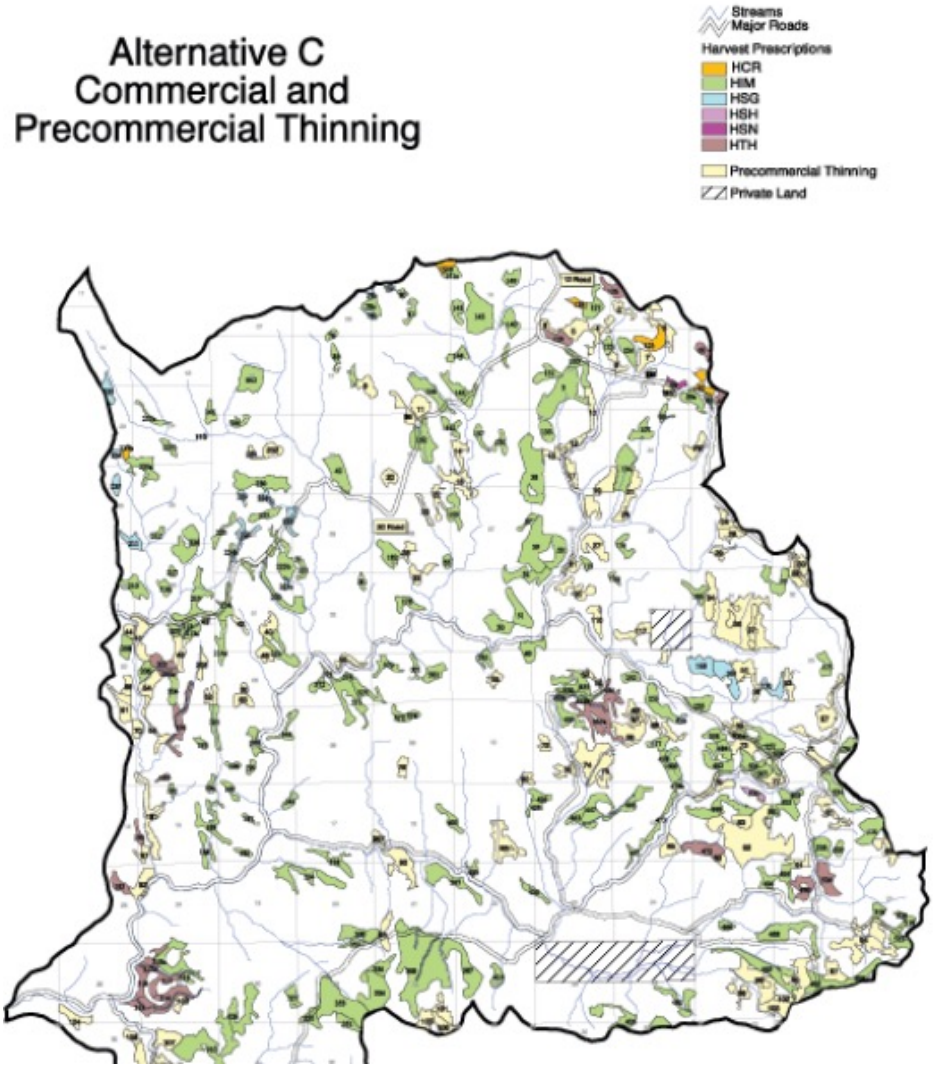

Figure 2. Deep Vegetation Treatment FSEIS harvest and precommercial treatments excluding the prescribed burning. Areas in color are harvest and precommercial treatments.

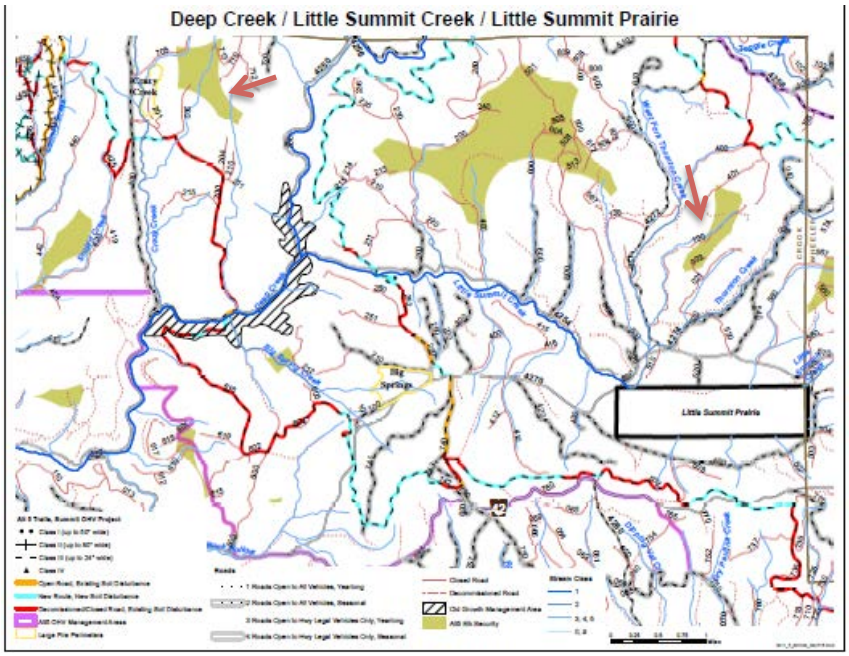

Figure 3. Summit Project Alternative 5. Shaded green areas are elk security habitat of any size, no minimum acre size. Information received by FOIA and on elk security habitat for action Alternative 5.

Reviewing the Deep Vegetation FEIS, there were no analyses to determine if security habitat would be impacted by the project, which would affect 46% of the entire watershed. Therefore, none was analyzed or subsequently protected by the Deep Vegetation project. Comparing the 2 maps of the Deep Vegetation Treatment areas and the proposed OHV trails above, it appears that there was elk security habitat that are/were treated with timber harvest. There may have been more in the existing condition of the No Action Alternative; we will never know how much was impacted since those units have likely been treated and the existing condition in 2004 no longer exists today. Now, the ONF proposes to further impact the Deep Creek watershed that has less than 8% elk security habitat left with implementing an OHV trail, and further compound the harm to important elk habitat.

By implementing any of the action alternatives, there will be significant impacts to elk security habitat, and the estimates above do not include the effects of all roads, routes and trails currently driven on the landscape, only open roads (Maintenance Level (ML) ML-2-5). This will significantly degrade elk security habitat and further move elk to exterior boundaries of the forest, and off forest onto private lands during the spring and summer when elk are normally on the forest, calving and rearing young. The Ochoco Mountains are characterized by big game that summer on the forest and then move downslope to winter range that is primarily on private land that circles the forest at lower elevations. Most private landowners tolerate current winter elk use, but an increase in use during the spring and summer, when the big game are historically on the forest, would likely require ODFW to significantly reduce the elk [and deer] populations. This in turn would significantly reduce ODFW's management objectives for big game species and hunting opportunity and associated economic benefits.

The elk security habitat acres shown in Table 144 and the impacts shown above are predicated on the use of the 2011 Travel Management Plan and the annual Motor Vehicle Use Map showing *only open roads*

(Management Level (ML) 2-5) which ONF used to calculate roads/routes per square mile). As described in Item 2 below, the ONF landscape is covered with roads, trails and other routes that are physically open for motor vehicle use. While the analysis only included open roads, if the analysis were properly conducted using all roads, trails and other routes physically open on the landscape that the public drives for recreational pleasure or work, it would demonstrate even greater impacts to elk security habitat.

All action alternatives would allow OHV trail use through current elk security habitat. However, impacts to the Deep Creek watershed disproportionally affect 73.7 % to 99.9% of the remaining functional elk security habitat by action alternatives. Elk security habitat in Lower Beaver and Upper Ochoco Creeks is also greatly impacted by proposed OHV trail routes. As one can see, the functional habitat remaining in these watersheds, primarily due to ongoing disturbance from timber harvest and roads, is a fraction of what was available historically. Further impact results in less available habitat to support elk on the ONF, which will reduce the potential to meet LRMP and ODFW elk management objectives.

More broadly, over the entire Project area, the SFEIS (p. 308) states that "*Distance banding analysis of the combination of existing open roads (based on operational maintenance level) and proposed trails indicates that there would be a total of 44,944 acres of National Forest lands greater than 800 m (1/2 mile) from an existing road (elk security habitat). This represents approximately 15% of the project area (a 2% reduction compared to existing condition).*" Each incremental change from vegetation treatment project and now the proposed OHV project chips away at elk security habitat and therefore, over time, impacts long term productivity of elk on the forest.

1C. Scablands

Another important special habitat that will be impacted by an OHV system is scablands. These open meadow or shrub-like areas have very shallow soils, and support associated plants that are adapted to such unique habitat. Gast et al. (1991) reported that scabland vegetation, located in dry, hot, thin soils are very vulnerable to high levels of disturbance. Shrub-scabland ecosystems have rocky, shallow soils and are commonly found on topographically high sites such as ridges. Dominated by scattered sagebrush, bunchgrasses and forbs these sites are particularly exposed to summer heat and dryness, winter cold and spring frost heaving.

The LRMP recognized the fragile nature of this community and designated protection standards that included "ORV use on scablands will be limited to snowmobiles operating on an adequate snow base." "Scablands are recognized as among the most fragile ecosystems on the Ochoco National Forest. Damage to the soil and vegetation as a result of management activities is nearly impossible to mitigate. This is a result of their having very shallow soils which are subject to severe water saturation and frost heaving during winter, thus making revegetation virtually impossible." (LRMP 4-197). The LRMP standard and guidelines required that "Road construction on scablands will be limited to long-term collector, arterial and local roads. Temporary or short-term roads or trails will not be constructed across scablands unless there is no other feasible alternative." (LRMP 4-226). Damage to the soil and vegetation as a result of management activities, particularly motorized vehicles, is nearly impossible to mitigate.

Biological soil crust is another fragile component of the shrub-scabland ecosystem. It functions as living mulch by retaining soil moisture, discouraging annual weed growth, and influences soil stability and

fertility. Once disturbed, natural recovery rates are found to be very slow and re-establishment can be extremely difficult, if not impossible (Belnap et.al. 2003).

Ouren et al. (2007) conducted a literature synthesis of the effects of OHVs on natural resources including soils. OHVs impact soils and overall watershed function by altering via soil compaction and destroying soil crusts (biotic and abiotic) causing increased soil bulk density and decreased permeability. As soil compaction increases, its ability to support vegetation diminishes because the resulting loss of porosity inhibits the growth of root systems and reduces infiltration of water. As vegetative cover, water infiltration, and soil stabilizing crusts are diminished or disrupted, the precipitation runoff rates increase, which further accelerates soil erosion. Jones (1999) reported that "Loss of the insulating effects of plant [from OHV impacts] cover and changes in the heat capacity of compacted soils causes soil temperatures to increase by as much as 10^{o}C in daytime and decrease by as much as 3^{o}C in nighttime", which in turn, further inhibits the ability of native plants to re-establish.

Switalski and Jones (2008) reported on impacts of OHVs to forest soils but the concepts apply to scabland soils as well. Healthy forest soils provide nutrients and are the physical base for plants. Since OHVs can weigh several hundred pounds, they compress and compact soil reducing its ability to absorb and retain water, decreasing soil fertility by impacting microscopic organisms that are important for nutrient cycling.

The SFEIS (p. 392) and LRMP (4-197) states that "*Scablands are recognized as among the most fragile ecosystems on the Ochoco National Forest. Damage to the soil and vegetation as a result of management activities is nearly impossible to mitigate. Revegetation is nearly impossible due to water saturation and frost heaving."* However, despite recognizing the fragile nature of scabland, the ONF proposes to amend the 1989 LRMP to allow OHV trails and use on the shrub-scabland ecosystem. The SFEIS (p. 440) states that "*The proposed amendments are site-specific and apply only to proposed segment of connecter trail, most of which are located on existing disturbance*." Contrary to the preceding claim by the ONF, all action alternatives have new trail construction and conversion of closed/decommissioned roads to OHV trails. These are not largely connector trails as stated, but have disturbance from new construction and conversion from closed and decommissioned roads that ranges from 63% to 79% of the miles of OHV trail proposed on scablands (SFEIS, Table 161, p. 368). We find it disingenuous to state that these proposed trails are "*most of which are located on existing disturbance*" (SFEIS p. 440) when the vast majority of trails are new construction and re-opening of closed and decommissioned roads.

The ONF claims that the LRMP amendment applies to proposed segments of "connecter trail" is also frankly misleading. The OHV trail routes in the east implementation area are loop trails not simple connecter trails. The SFEIS (p. 440) further states that *"trail segments are proposed in order to allow orderly and logical trail system by linking existing roads…*" There are approximately 26 miles of new construction in the east implementation area. Alternative 5 proposes 8.5 miles of new construction and 7.8 miles of conversion from closed/decommissioned roads, respectively. This many miles of new construction and reopening of closed and decommissioned roads is not just "linking existing roads". It's developing an outdoor play area for motorized recreationists.

The only action proposed to minimize impacts to scablands is the broad statement in the PDCs "*where trails cross scablands treatments to prevent erosion will be implemented. Techniques may vary by trail type and may include but are not limited to rock surfacing or soil amendments*" (SFEIS p. 33), which has

already been demonstrated in preceding statements is almost impossible to do. The SFEIS (p. 376) notes that "*A project design criteria was developed to protect TES plant habitat by closing the trail system when adverse conditions exist that may result in resource damage (rutting, runoff, etc.), however, in scabland habitat, once the damage is done, it is permanent*". Given the likelihood that rutting and runoff will significantly occur during the runoff periods, such as during spring runoff and summer thunderstorms on the ONF, the effects of OHV trails are impossible to repair. Once the damage is done, it's irreversible.

The SFEIS justifies the impacts as insignificant by comparing the minimum number of acres of disturbance from trails to the total numbers of acres of scablands in the project area, thereby dismissing the impacts. The SFEIS also fails to disclose the total number of acres of shrub scabland already impacted in the project area by existing roads on the landscape including open, closed, decommissioned, temporary, and user-created trails. Further, the SFEIS (p. 454) not only fails to address minimizing impacts as required under the minimization criteria, but also claims that "*Proposed trail segments in all action alternatives are in ecologically suitable locations*" (SFEIS p. 454). We're not sure what the definition of an "ecologically suitable location" is but it's not defined in the SFEIS. In the vegetation section, the SFEIS does not address minimization to shrub-scablands. All action alternatives propose to re-construct closed and decommissioned roads, and construct new trails affecting a total new disturbance of 6.45 to 21.73 miles of the shrub-scabland ecosystem.

The ONF did not provide any maps showing the location of scablands and how proposed OHV trails might impact, much less be located to avoid and minimize impacts to these special habitats. Despite acknowledging the fragility of scablands, Alternative 5 as modified includes at least 23.6 miles of trail and one staging area in scabland habitat. Instead of designing a project to protect these fragile landscapes, the ONF proposes Forest Plan amendments so it can authorize new motorized trails in scablands (SFEIS p. 28 and 441-444). In conclusion, the ONF failed to meaningfully apply 36 CFR 212.55 (b) (1) and (2) minimization criterion to each trail being considered for designation in these special habitats. For all action alternatives, the ONF failed to locate OHV trails away from scablands and designate effective site-specific actions to negate the impacts of the proposed trail system.

In addition to the direct impact to scablands, there is a Regional Forester's Sensitive Plant species located on scablands known as Henderson' needlegrass. Dewey (2013) reported that principal threats to this species include 1) invasive plant species, 2) livestock grazing, 3) timber and fuels management activities and 4) off-road vehicle use. In Oregon, nearly all documented sites of this species occur fully on federal lands. Twenty-six populations of Henderson's needlegrass occupy 144 acres in the Project area. It occurs on shallow scablands with little vegetation; the greatest potential for impacts comes from soil disturbance. All action alternatives propose OHV trails within sensitive plant populations, with proposed trail distances within the plant populations' that range from 538 feet to 1,836 feet.

Antelope (Pronghorn) also occupy the dry open shrub-scabland ecosystem when not disturbed for many of their life history requisites. Pronghorn use their eyesight and hearing to detect any threat from predators hence their preference for wide-open expansive terrain (O'Gara and Yoakum 2004). SFEIS Table 148 (p. 315) and Table 169 (p. 395) show that of the 32.4 miles of OHV trail in pronghorn habitat, 13.35 miles occur in the shrub-scabland ecosystem.

OHV trails through the shrub-scabland on the ONF would increase soil compaction, damage biological soil crust, affect native plants, and displace pronghorn antelope. Because the shrub-scabland is very open there is a significant risk of OHV riders riding off the designated route to "play", increasing the amount of impacts to this fragile habitat. A good example of scablands that are already impacted by OHV users is in the Rager country in the Eastside Implementation Area where much of the forest consists of stringer stands of timber along stream bottoms and in draws, while scablands dominate the ridges. While hiking and hunting the Rager country, we frequently find illegal OHV trails running across scablands. We have also repeatedly encountered OHV users driving closed and decommissioned roads. As an example, Figure 4 is a road on a scabland with fresh tracks visible.

Figure 4. A scabland with a road in the Deep Creek watershed. Note the broad expanse that is easily driven by any OHV.

Under all action alternatives, the ONF failed to locate OHV trails away from the fragile shrub-scabland ecosystem, and the ONF failed to demonstrate site-specific actions to negate the impacts of the proposed trail system on the shrub-scabland ecosystem. The ONF failed to disclose how it minimized Project effects to shrub-scablands, the Regional Forester Sensitive plant Henderson's needlegrass, and pronghorn antelope.

1D. Late Successional Old Growth

The ONF failed to disclose how it minimized Project effects to late successional old growth located in Old Growth Management Areas (MA - F6 Old Growth).

The ONF LRMP recognized the importance of retaining late successional old growth stands for dependent and associated wildlife species. The LRMP established Old Growth Management Areas (MA-F6) to provide habitat for the pileated woodpecker and other old growth associated species as part of the Regional Foresters Minimum Management Requirement (MMR). The LRMP designated management areas specifically for old growth, setting aside approximately 2% of the ONF into MA-F6 Old Growth. It used the pileated woodpecker as the ONF Management Indicator Species (MIS) to monitor the health of

the old growth areas (LRMP 4-176). Further, the ONF delineated supplemental pileated woodpecker feeding areas of similar size immediately adjacent to the old growth areas.

Generally, each old growth area is approximately 300 acres in size providing the primary nesting habitat plus 300 acres of supplemental feeding habitat immediately adjacent. Given the landscape configuration of forested and non-forested plant association groups, many of the ONF MA-F6 Old Growth areas in the Project area are not blocks of interior habitat, but rather they conform to the northern aspects of topographic features (i.e. buttes, canyons and draws).

As the MA-F6 Old Growth areas are limited to just barely 2% of the entire ONF. Previous timber management practices have reduced much of the late successional old growth stands in the Blue Mountain forests including the ONF (Powell 2011). The intent of the LRMP guidelines was to designate old growth areas to maintain the biological integrity and ensure functional habitat for old growth dependent wildlife species. Wildlife species that are dependent on old growth structural components tend to be specialists. Wildlife specialists are species that require unique habitat types versus those that can use multiple habitat types or wildlife generalists (i.e., coyotes). Specialists also tend to be federal or state listed species as sensitive, threatened or endangered due to the significant habitat changes that have taken place as a result of past management practices. Old growth habitat is very limited today compared to historic conditions as portrayed (Powell 2011). Wildlife species dependent on old growth habitats on the ONF will be affected by changes to the existing old growth characteristics proposed by this Project.

The ONF LRMP Transportation section for the Management Area Standard and Guideline for Off-road vehicles stated that "No motorized use allowed" in MA-F6 Old Growth (LRMP 4-233/234). Further, in the ONF LRMP Fish and Wildlife section, the Management Area Standard and Guideline for Pileated Woodpecker Habitat, which applies to MA-F7 Old Growth area states "*Vegetation management (except prescribed livestock use) will not be allowed*, until further research is available on the needs of the dependent species." (LRMP 4-251). In other words, vegetation management or removal to accommodate OHV trails is not allowed.

The ONF essentially dismissed the impact to old growth as insignificant by using the small footprint of the project compared to the large size of the project area. Appendix A of the Final Wildlife Report assumes 10 feet of forest clearing along proposed trails, resulting in vegetation clearing in both the old growth areas and the supplemental feeding areas. The vegetation clearing for each action alternative is Alternative 2 (6.5 acres), Alternative 3 (2.6 acres), Alternative 4 (6.5 acres) and Alternative 5 (4.4 acres). The SFEIS (p. 454) states that "Designation of a motorized trail system, including construction of new trail segments, is unlikely to affect forest vegetation (i.e. timber stands) in any measurable way." Appendix A of the Final Wildlife Report estimates trail (vegetation) clearing for all action alternatives range from 2.6 to 6.5 acres and OHV trail lengths range from approximately 2.14 to 5.39 miles.

The SFEIS (p. 454-455) fails to provide any discussion regarding disturbance of wildlife and disruption of wildlife habitats by the trail designation for old growth dependent and associated wildlife, including the pileated woodpecker. The 2011 Travel Management FEIS used a distance of 200 meters (660 feet) each side of a motorized route as a metric to determine general wildlife disturbance, yet in the analysis for this project, the disturbance is only a 10 foot trail width. We don't understand the discrepancy other than the intent of the Project is to dismiss impacts to wildlife species by using such a small footprint.

A good example where the ONF failed to consider alternate routes to avoid Old Growth areas is the proposed OHV trail inside and adjacent to the old growth area OG-D1-08 near Indian Butte north of Big Summit Prairie (SFEIS p. 441). Much of the area around this old growth area has been treated with vegetation and fuels projects over the past several decades, with approximately 7,400 acres scheduled for commercial harvest and precommercial thinning as part of the recent Howard Elliot Johnson Fuels and Vegetation Management Project (May 2011 FEIS). This old growth area is an island of habitat surrounded by a sea of treated areas and roads, left on the landscape to provide biological diversity and habitat for dependent Old Growth species. There were many choices to locate this trail outside of the Old Growth area but the proposed trail travels through and then adjacent to this island of unique habitat. There were plenty of opportunities to place the trail on mixed use roads to completely avoid the old growth area that were not chosen in any action alternatives.

Another example is the proposed OHV trail in the Deep Creek area OG-D2-02 (SFEIS p. 444). Because of the poor quality of maps in the SDEIS and SFEIS and lack of disclosure of proposed lengths of trail in each Old Growth area it's difficult to estimate the impact of specific OHV trails in each Old Growth area. A best guestimate using the extremely poor maps is that there are approximately 0.35 miles of new construction and 2.5 miles of conversion of closed and decommissioned roads to OHV trail in the Deep Creek Old Growth area. Much of the Eastside Implementation Area is stringer stands of timber along streams and in draws, while scablands occupy much of the uplands and ridge areas. The choice to place a motorized trail that impacts many resources including crossing a Class I fish bearing stream (Deep Creek) and traveling up a steep slope into the Deep Creek Old Growth area is an example of how the ONF failed to avoid important fish and wildlife habitat on the landscape. In order to implement the trail, vegetation will have to be removed further violating LRMP standards and guidelines.

Under all action alternatives, the ONF failed to locate OHV trails away from MA-F6 Old Growth areas and the pileated woodpecker supplemental feeding areas. The ONF also failed to demonstrate site-specific actions to negate the impacts of the proposed trail system on the MA-F6 Old Growth areas.

1E. Gray Wolf and Use of the ONF

The gray wolf is federally listed endangered west of Hwy 395 (ODFW 2010, 2016; US Fish and Wildlife Service 2016). It is also under the jurisdiction of ODFW's Wolf Management Plan. Both federal and state fish and wildlife agencies have an interest in the recovery and management of the Gray Wolf. The most recent 2015 ODFW summary report of wolves with telemetry collars shows expanding distribution as wolves have moved from occupied habitat in northeast Oregon and, with increasing regularity, moving through the ONF on its way to occupying portions of the southern Cascades, Summer Lake area, and the Siskiyou Mountains (Figure 5).

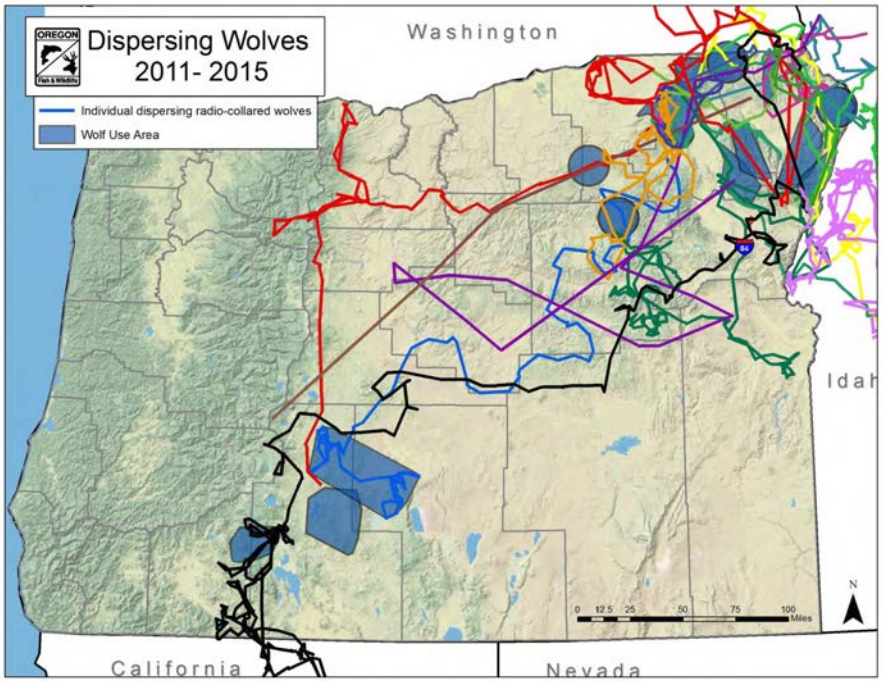

Figure 5. Dispersal of radio-collared wolves from northeast Oregon to new habitats in Oregon.

Since the compilation of this data, there have been reputable reports of observed wolves in a small pack on Lookout Mountain in the fall of 2015. A wolf track was observed in the South Fork Crooked River (south and east of the ONF) drainage in the fall of 2015, and a wolf was observed traveling through Big Summit Prairie (middle of the Summit Trail Project Area) in January 2016 (Greg Jackle, ODFW District Wildlife Biologist, pers. comm). In the past few years, three collared wolves were documented crossing through the Ochoco Mountains (Figure 5) indicating that the ONF has become a likely migratory path for large carnivores and an important connective corridor between the Blue Mountains and the Cascades. The presence of large blocks of public land is correlated with wolf habitat (Mladenoff et al. 1995; Larsen and Ripple 2006). In a recent conversation with John Stephenson, wolf biologist with the U.S. Fish and Wildlife Service, it is expected that a pack could become established on the ONF as packs are now established throughout northeast Oregon, near Summer Lake, and in the southern Cascades and Siskyou Mountains of Oregon (Stephenson, pers. communication, 2016).

The SFEIS (p. 255) states that "*the potential for disturbance from motorized recreation would not be very different from disturbance associated with the existing open road system; the project is not expected to affect distribution and population size of prey species for wolves. The selection of any alternative would have no effect on potential wolf denning, foraging or dispersal habitat in the project area. Because the project would not affect wolves, no cumulative effects are anticipated*". This information disregards the latest information regarding wolves moving through Oregon and reoccupying historic habitat. The comment also discounts the increase in motorized use of the 659 miles of mixed-use roads that will be caused by the Project if it is implemented.

Wolf prey is usually large ungulates such as deer, elk and moose (Pletscher et al. 1997). Since elk and deer are the most abundant ungulates in the Ochocos, they are the likely primary prey species in the Ochocos. Therefore, based on current science and literature of big game species and carnivores, this

Project will affect both elk [which are the primary prey species for the gray wolf in northeast Oregon] and the wolf itself by 1) increasing open road and trail densities and 2) increasing road and trail use rates [frequency], both of which will cause shifts in elk distribution. In regards to the wolf's primary prey species, elk are displaced by motor vehicles, and the Project may cause a temporary or permanent reduction in functional habitat. Numerous authors and research at Starkey Research Station have demonstrated that elk in areas with higher road densities and areas with higher human disturbance from motor vehicles have increased stress levels and increased movement rates and energetic costs (Rowland et al. 2000, 2005; Wisdom et al. 2004, 2005). These, in turn, reduce body condition, which is a primary factor affecting pregnancy rates and can influence juvenile growth and survival. Therefore, this Project is highly likely to affect performance of individual elk and have subsequent population level effects.

Beyond impacting the wolf's primary prey species (elk population and distribution), the OHV Project could directly influence and reduce the probability of wolves using the area for denning, foraging or dispersal. Wolf habitat suitability is strongly and positively correlated with public ownership (Mladenoff et al. 1995, Carroll et al. 2003, Larsen and Ripple 2006), and by moving the wolf's primary prey species to private lands, this Project has the potential to shift wolves to private lands. Since prey availability and distribution are a strong determinant of wolf habitat suitability, this shift in prey distribution associated with the OHV Project could cause wolves to forage on private property where wolves are less likely to survive, due to increased conflict with humans. This Project will increase motorized route densities and human use, which will decrease the suitability of habitat in the Project area for wolves (Belongie 2008). Concluding that this Project will have no effect on wolf habitat in the Project area ignores the best available science. This disregard by the ONF of recent gray wolf movement and expansion through the forest is particularly concerning as the projected increased use on both trails and mixed-use roads and will diminish prospects for re-establishment of the gray wolf in historic habitat on the forest.

Gray wolves are both a federally listed species and state managed species that the ONF must adequately consider for potential impacts in the proposed Project area. Failure to consider impacts to wolves by an OHV trail system will impede efforts by both federal and state agencies for conservation, recovery and management of this species. Further, wolves will follow their prey base down to private lands, as deer and elk move off the forest from being pushed by the development of an OHV trail system (ODFW December 8, 2009 letter to the Ochoco National Forest for the Travel Management Plan FEIS).

ODFW (2010) reported that wolves historically were common in Oregon and when a bounty was offered in 1913, within 8 months, 6 wolf payments were made for wolves killed in Crook County. While there are no current known wolf packs currently occupying ONF lands, as demonstrated by collared wolves in Figure 5, the species is increasing use of the forest as a migratory corridor for reoccupying habitat in other areas of Oregon and have a reasonably high likelihood of establishing a wolf pack in the ONF vicinity.

The ONF failed to meet its obligations to support federal and state agencies in their recovery goals for the gray wolf. It also failed by potentially causing increases in landowner damage by wolves to livestock by pushing big game prey species off the forest with an OHV trail system. Under all action alternatives, the ONF failed to locate OHV trails away from relatively undisturbed habitats such as Old Growth areas and Bridge Creek Wilderness and the ONF fails to demonstrate site-specific actions to negate the impacts of the proposed trail system on the gray wolf. In addition, the ONF fails to use current science and assist

federal and state managers achieve recovery goals for the Endangered Species Act listed endangered gray wolf (ODFW 2010; US Fish and Wildlife Service 2016).

1F. Noxious and Invasive Plant Species

The spread of exotic and noxious weeds is one of the most pervasive threats to public lands and degrades native plant communities that support important fish and wildlife habitat. Invasive and noxious plant species colonize disturbed sites where native vegetation has been disturbed, reduced or removed. OHVs disturb and destroy native vegetation, create bare soils, and facilitate the spread of noxious weeds. Switalski and Jones (2008) reported that OHVs "are a major vector for non-native invasive plant species. With knobby tires and large undercarriages, ORVs can unintentionally transport invasive non-native species deep into forestlands. For example, one study found that in a single trip on a 10 mile course in Montana, an ORV dispersed 2,000 spotted knapweed (*Centaurea stoebe*) seeds (Montana State University 1992). In Wisconsin, a survey of seven invasive plant species along ORV routes found at least one of these exotic plant species on 88% of segments examined (Rooney 2005)."

Executive Order 13112 directs federal agencies to reduce the spread of invasive plants, which has been identified as one of the four major threats to ecosystem health. One Project Design Criteria is "Do not route trails, place staging or camping areas, or other disturbance within areas containing invasive plants" (SFEIS p. 33). Yet that is exactly what all action alternatives propose to do. Alternative 5 will have 3.2 acres trails (estimated trail width of 10 feet X the number miles of trail) in areas infested with houndstongue, Canada thistle, medusahead, spotted knapweed, and diffuse knapweed (SFEIS p. 387). It will also have staging areas at Walton Lake and Cottonwood Pit that have infestations of spotted knapweed, Canada thistle, and Russian knapweed (SFEIS p. 387).

Another PDC is that all trail construction and maintenance equipment be cleaned of all dirt and plant parts before entering NFS lands (SFEIS p. 34), but this standard is not held for the OHV riders who should be cleaning their equipment before and after riding Summit OHV trails. The SEIS (p. 384) reports that "*OHVs brought to the project area that are not clean may harbor invasive species seed and plant parts that can introduce new infestations. OHVs can also run through existing invasive species infestations, further spreading the population by creating additional disturbance for a seed bed, or picking seed and carrying it to another portion of the area. There are several areas open to cross country travel (such as rock pits) that have invasive species populations."* The following statement summarizes the expected effect of the no action alternative. SFEIS (p. 384) "*OHV use would continue to occur under the No Action alternative… Less soil disturbance and fewer vehicles results in less risk of invasive species introduction and spread in this alternative*."

However, under all action alternatives, there will be a very high risk of spread of noxious and invasive weed species. SFEIS (p. 385) states that "*When tires of motor vehicles displace topsoil and damage vegetation, the resulting bare soil becomes potential sites for invasive plant establishment. A Montana State University Extension Service Bulletin (MSU 1992) explains that rapid dispersal of invasive plants is characteristic of motorized routes where "ORVs can quickly spread 2,000 knapweed seeds over a ten mile area." Sheley et al. (1998) state, "Protecting and conserving the surface soil are critical to the long-term sustainability of healthy, functioning ecosystems. In one study, runoff was 1.5 times higher and sediment yield was 3 times higher on spotted knapweed-dominated plots than on plots dominated by the*

native bluebunch wheatgrass. Loss of soil because of invasive plants may have very serious consequences in the future." and *"Alternatives that propose more area open to motor vehicle travel and that have higher densities of designated routes, staging areas, trailheads and play areas pose a higher risk of invasive plant spread, introduction into new sites, and create greater challenges for detecting and controlling new invasive plant sites"* and "*All [action] alternatives propose trails circling around Little Summit Prairie that was designated as a sensitive resource area by the Paulina Ranger District, and who recommended to prohibit off-road OHV use. This area contains important resource attributes including a major population center for Peck's mariposa lily, a Regional Forester's sensitive plant species; a high density of prehistoric archaeological sites; soils that have a high-risk for erosion; and one of the most interconnected habitats for redband trout, another Regional Forester's sensitive species"* (SFEIS p. 386).

The SFEIS (p. 387) states "*All action alternatives would result in an increase of invasive plants across the project area. This in turn would result in additional expense for controlling invasive plants on the Forest. The nature of the proposal involves a constantly disturbed environment due to continued use of the trail system by vehicles coming from different parts of the state or country with a high probability of bringing in invasive plant seed and plant parts…Using the low end of estimated [OHV] increase in the first half of the decade (due to the current recession), and using the high end on the second half of the decade, it is estimated there may be 15,000 riders using the Ochoco Summit trail system by 2020. Concentrated and increased of use in the area will result in a constant need to monitor the trail system for invasive plant presence, and an increased need for treatment."* SFEIS (p. 388) asserts "*All action alternatives result in a high risk, with differences due to magnitude."*

These assessments of invasive species impacts indicate that expanded OHV use in the proposed project area will exacerbate the spread of noxious and invasive species in the Project area and that violates Executive Order 13112.

2. The ONF Failed to Conduct an Adequate Cumulative Effects Analysis on Wildlife and Elk Security Habitat.

The Council on Environmental Quality (CEQ) regulations at 40 CFR 1508.7 and 1508.8 define cumulative effects and the required analysis. The Forest Service Handbook 1909.15: National Environmental Policy Act Handbook, Chapter 10: Environmental Analysis: Section 15.3 adopted the CEQ regulation and defined the framework in development of meaningful cumulative affects analyses for project proposals. The Forest Service is to describe the effects to each resource that overlap in time and space for past, present and reasonably foreseeable future actions regardless of ownership, that may combine with effects of the proposed action and result in cumulative effects. Cumulative effects can be additive or synergistic resulting in effects greater than the sum of the parts.

The SFEIS failed to conduct a full cumulative effects analysis from recent fires, and vegetation and fuels treatment projects on the forest that also add new road construction, and temporary roads. There are two essential issues with inadequately assessing these large area fires and projects. The first is not adequately including all the new road construction, reconstruction and temporary roads, which as explained above have impacts on both fish and wildlife habitats, and the second is failing to account for changes in elk security habitat with these fires and project.

The 2016 SFEIS (p. 306) in the Wildlife Section, states "*Approximately 81,000 acres of vegetation and fuels management are proposed for treatments including commercial thinning, small diameter thinning and prescribed burning in these projects. The primary effect of these vegetation management projects on big game is related to roads used for access to treatment areas, roads closed as part of these projects, and changes in cover as a result of proposed vegetative treatments*." Later, the Botany section (SFEIS p. 389) reports conflicting information that states that "*Approximately 130,000 to 150,000 acres of vegetation and fuels management are proposed for treatments including commercial thinning, small diameter thinning and prescribed burning*."

The 2011 Howard Elliot Johnson Vegetation and Fuels Treatment Project One will treat a large area north of Big Summit Prairie with over 13,000 acres of commercial harvest, precommercial thinning, and prescribed fire. The following two figures display how much of the project area was or will be treated (Figures 6 and 7).

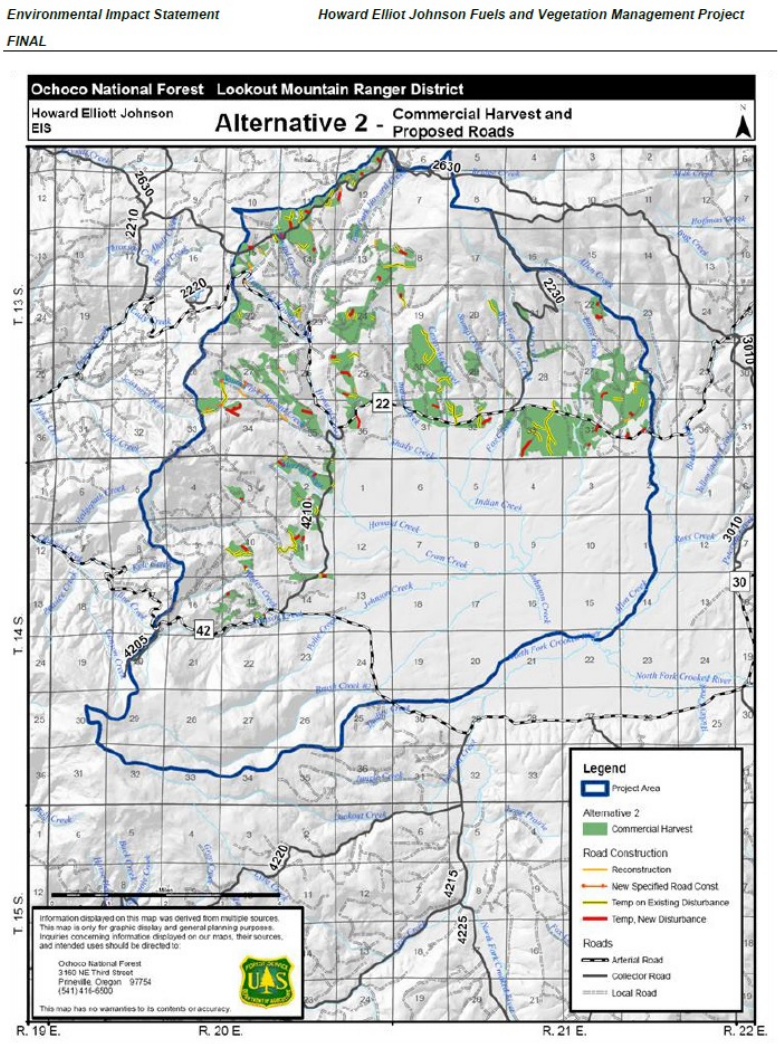

Figure 6. Howard Elliot Johnson Commercial Harvest and Proposed Roads; areas in green are commercial harvest; from Howard Elliot Johnson Vegetation and Fuels Management FEIS.

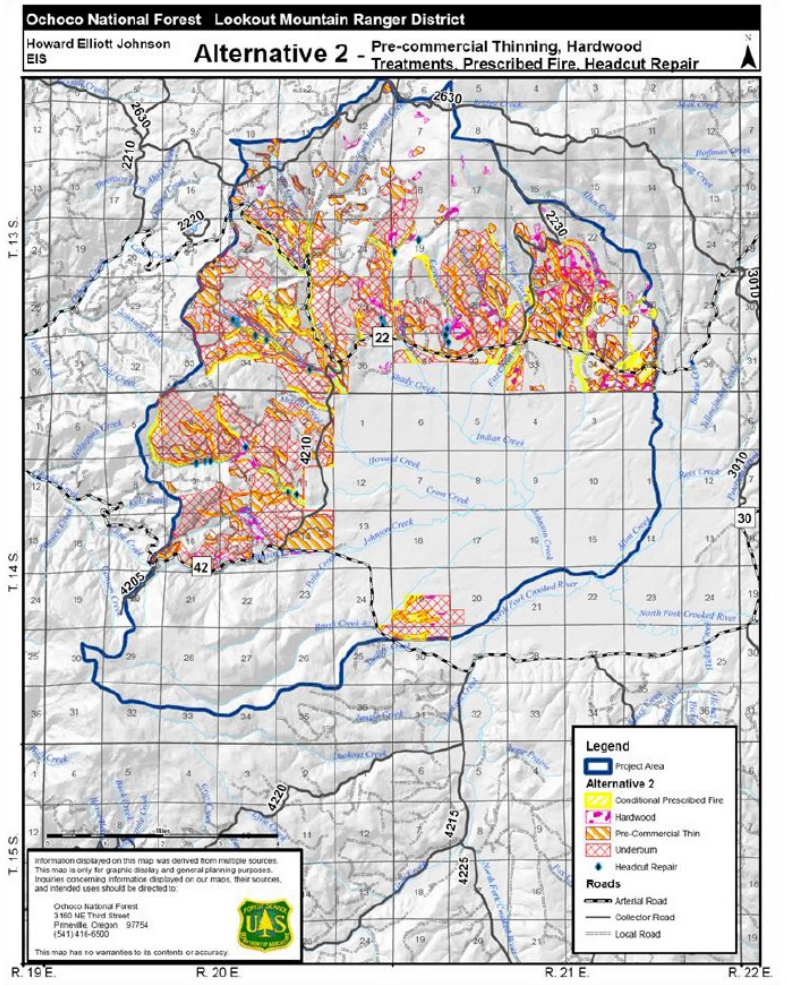

Figure 5. Map of Alternative 2: Pre-commercial Thinning, Hardwood Treatments, Prescribed Fire & Headcut Repair.

Figure 7. Howard Elliot Johnson Pre-commercial Thinning, Hardwood Treatments and Prescribed Fire. Colored areas depict treatment areas. From Howard Elliot Johnson Vegetation and Fuels Treatment FEIS.

The two figures above (Figures 6 and 7) demonstrate the large area destined for treatment that will impact elk security habitat just for one project.

SFEIS Table 7 (p. 53-55) lists the "connected actions" of past, present and future actions include recent wildfires, vegetation and fuels treatment projects and other activities. I looked up the projects for which there was information online and summarized areas to be treated either by timber harvest, precommercial thinning or prescribed fire for each project, along with estimates of acres burned by wildfires. Table 2 is a synthesis of the information I could find on these past, present and foreseeable future projects. Contrary to the ONF estimate of "81,000 acres" in the Wildlife Section, there are almost 133,000 acres that will have been burned by wildfires or treated with vegetation and fuels treatment projects and affect a much

larger area that was stated in the SDEIS or SFEIS in the wildlife analysis of impacts on elk security habitat.

Table 2. Recent fires and past, present and foreseeable future vegetation and fuels projects.*, **, ***.

Project/Fire	Type	Year	Harvest	Precommercial	Prescribed Burn	Total Acres
Ochoco Complex	Wildfire	2014				2956
Bailey Butte	Wildfire	2014				7789
Maxwell	Wildfire	2006				2317
Total Fires						13062
Spears	Veg & Fuels	2007	4935	10935	15162	21567***
Canyon	Veg & Fuels	2010	4099	5362	2038	11499
Howard Elliot Johnson	Veg & Fuels	2011	4370	3007	6247	13624
Jackson	Veg & Fuels	2012	6303	7779	7485	21567
Wolf	Veg & Fuels	2014	4706	988	5000	10694
Gap	Veg & Fuels	2016	14037	2027	5587	21651
Black Mtn	Veg & Fuels	proposed	5364	1040	3234	9638
Total Veg & Fuels						119705
Total Fires & Veg & Fuels						132767

* Vegetation and Fuels treatment acres exclude juniper and hardwood treatment areas.
** Excludes Blue Mountain Resiliency project since no acre estimates were available.
*** Portion of Spears is outside the Summit Trail Project area.

Clearly, the number of acres in Table 2 is substantially greater than the estimate in the analysis completed in the wildlife section on elk security habitat. The SFEIS fails to display on a project-by-project basis the acres of treatment, and new and temporary roads and how they affect elk security habitat. Data should have been displayed in a table by subwatershed and watershed for treatment acres and roads. It is critical to display both the road information with the vegetation and fuels treatment project information to understand cumulative effects.

The SFEIS failed to analyze and disclose the cumulative effects to elk security habitat by fully accounting for the cumulative effects of wildfires, vegetation and fuels treatment projects; along with the addition of new roads, temporary roads, user-created trails and the Summit trail system. The ONF should have employed the distance banding analysis for all roads on the landscape, not just the "Motor Vehicle Use Mans" (MVUM) which designates open roads. By not analyzing all roads, not just open roads, the ONF underestimates the effects of the roads and the vegetation and fuels treatment projects to elk security habitat. The addition of the OHV trail system along with high road densities –open, closed, decommissioned, proposed temporary - and numerous treatment projects would reveal why elk are increasingly moving from summer range on the ONF to the forest fringe and adjacent private lands earlier and earlier in the season.

A cumulative effects analysis that assesses the loss of significant acres of security cover from past, present, and foreseeable future projects and includes all motorized routes (open, closed, decommissioned, temporary, and user created) would provide a much more sound and realistic baseline from which to

assess Project effects. This baseline would provide a more accurate picture of existing conditions relative to past projects and determine actions that would better meet LRMP standards and guidelines, yet the ONF failed to do so. A more realistic understanding of existing conditions relative to LRMP goals and objectives and standards and guidelines would assist decision makers and the general public to better understand how much of the wildlife habitat has been affected by past decisions. The Ochoco Summit Trail system construction along with the projected increase in use of motorized designated trails and mixed-use roads will significantly increase impacts from existing conditions, thereby significantly impacting wildlife resources as described previously in this report.

The Ochoco Summit Project does not include a substantial amount of vegetation management, with only limited clearing and hazard tree abatement along trails and staging areas, so this Project does not tell the real story of cumulative impacts to structural habitat components when considered in combination with past, present and reasonably foreseeable salvage, hazard tree removal, commercial harvest, thinning and prescribed burning treatments.

3. The ONF SFEIS Failed to Analyze Motorized Vehicle Use on All Roads, Routes and Trails on the Landscape to Determine Project Effects to Wildlife Species and Their Habitat.

Habitats for native plants and animals, including endangered and threatened species, are impacted by motor vehicles in several ways. A significant impact is habitat fragmentation and reduced habitat connectivity as OHV roads and trails proliferate across the landscape. Reduced habitat connectivity may disrupt plant and animal movement and dispersal; lack of connectivity results in altered population dynamics and reduced potential for recolonization if a species is extirpated from a given habitat (Haddad et al. 2015). Wildlife is also directly affected by excessive noise (decibel levels/noise durations well above those of typical background noise) and other perturbations associated with OHV activities. Disturbance effects range from physiological impacts—including stress and mortality due to breakage of nest-supporting vegetation, collapsed burrows, inner ear bleeding, and vehicle-animal collisions—to altered behaviors and population distribution/dispersal patterns, which can lead to declines in local population size, survivorship, and productivity (see discussion #4 below).

The SFEIS fails to analyze all roads, routes and trails physically occupying the landscape to assess the Summit Trail System impacts on all terrestrial resources. Therefore, it underestimates the real impact because it only includes the open road density, and does not account for closed (ML 1), decommissioned, and temporary roads, and user-created OHV trails. The ONF SFEIS reports that there are 1820 miles of roads in the Project area (SFEIS p. 56) across all jurisdictions. The SFEIS further refines miles of roads in the Project area in Table 8 (SFEIS p. 59) for 1738 miles, encompassing 301,580 acres or 471.22 square miles. Using these figures, the average road density across the Project area is 3.69 miles of road per square mile. The 3.69 miles of road per square mile product does not include any user-created trails, temporary roads associated with vegetation management projects, and decommissioned roads.

The SFEIS (p. 60) identifies 188 miles of ATV trail, 87 miles of motorcycle and 159 miles of shared use of which approximately 40% are on existing roads. Using this last data set, user-created trails would add another 260 miles of routes accessed by motor vehicles increasing the road density in the Project area to 4.24 miles per square mile. This figure does not include any temporary roads associated with vegetation management projects and decommissioned roads.

The following LRMP Management Areas within the Project area are generally roadless: Lookout Mountain Recreation Area (14,365 acres), Bridge Creek Wilderness (5,355 acres), Rock/Cottonwood Roadless Area (5,098 acres), and Round Mountain National Recreation Trail (1,018 acres). Combined these management areas contain approximately 33,529 acres of largely un-roaded habitat. Subtracting the management area acres from the total Project acres equates to 268,051 acres or 418.8 square miles.

Using the road miles plus the user-created miles, (1,738 + 260 = 1,998) to calculate the miles per square mile in the Project area less the above generally roadless management areas yields 4.77 miles of roads, routes and trail per square mile in the Project area. Again, the density figure still underestimates the real density of roads and trails because it does not include temporary roads for vegetation management or decommissioned roads.

The ONF LRMP Management Area map (SFEIS Appendix C, Map 2), show that General Forest, General Forest Winter Range, Winter Range, Lookout Mountain Recreation Area, Old Growth, and Wilderness - Bridge Creek provide the vast majority of management area acres within the Project area. ONF LRMP Standards and Guidelines state that in General Forest, road densities will be less than or equal to 3 miles per square mile (LRMP 4-259). In General Forest Winter Range and Winter Range, Standards and Guidelines state "except for constant service through routes, use will be restricted during the period of December 1 to May 1. Access routes will be limited to 1 mile per square mile during that period, and 3 miles/section on the average, the remainder of the year" (LRMP 4-257).

According to the ONF LRMP, the maximum allowed roads per square mile within the Project area would be 3 miles per square mile. Using the above calculations, the existing roads/routes per square mile currently being used by OHVs is greater than LRMP standards and guidelines by 1.77 miles per square mile in General Forest MA, which still doesn't include decommissioned and temporary roads.

The ONF motorized vehicle use policy for the Forest prior to 2011 was "open unless designated closed" (SFEIS p. 248). Forest users essentially had motorized access to anywhere they could drive as long as they weren't causing resource damage (i.e., not causing wildlife disturbance, damage to meadows and scablands, spread of weeds, etc.). With implementation of the 2011 Travel Management Plan (TMP), roads and off-road use was closed unless designated as open per the annual MVUM maps. Compliance with the 2011 TMP and MVUM maps across the ONF is low. The SFEIS states that vehicle use of the closed roads and user-created trails receive moderate to high levels of unauthorized motorized vehicle use (SFEIS p. 248). Personal observation and experience support this lack of compliance of motorized vehicles using closed roads, trails and routes. ODFW conducted a motorized vehicle survey on randomly sampled closed roads per the 2015 MVUM for 3 weeks from mid-May to early June, 2016. By June 3, 2016, the last day of the survey, 60% of the closed roads had received motorized vehicle use (Greg Jackle, ODFW District Wildlife Biologist, pers. comm.)

An example of a "closed" road is in the Little Summit Creek area and is not on the MVUM map (Figure 8). However, at the site, there is no gate or sign or any evidence that this road is closed. A forest user is supposed to know this road is closed by having their map with them in the vehicle while driving on the forest. Further, the 2015 MUVM map conflicts with the ONF color ½ inch to the mile forest-users map. The ONF forest-users map shows many 2015 MUVM closed roads as open roads, leading the forest user to believe all shown roads are open for their use. Many forest users do not know of the MVUM maps.

The ONF generates substantial non-compliance by forest-users by not funding and creating one forest-user map, combining the MVUM and the standard ½ mile forest-user map.

Figure 8. "Closed" road in the Project area less than 150 feet from Little Summit Creek. No gate or no obstruction is apparent. Only the MVUM map discloses that this is a "closed" road. The forest users map shows this road is available to the public.

The ONF only analyzed open roads from the 2011 TMP and MVUM maps to calculate road density per square mile even though they recognize that closed roads and user created trails continue to be used (SFEIS Alternative 1, p. 248)). ML1 "closed roads", user-created trails, unclassified roads, vegetation treatment unit temporary roads and decommissioned roads are not used in the calculation for road density per square mile. Many of the ML 1 roads, user-created trails, temporary roads and decommissioned roads are currently being driven by OHV users, forest visitors and other recreationist simply because these roads are physically open. There are no road closure signs on the vast majority of these roads, and there is little to no law enforcement present to educate the public. ONF forest users see roads wide open and they drive them.

All roads, routes and trails occupying the landscape that receive motorized use biologically impact wildlife and their habitat by providing access to predators (SFEIS p. 243), fragmentation of habitat (SFEIS p. 244), behavioral changes (SFEIS p. 245), impacts due to noise (SFEIS p. 245) and physical alternation of habitat (SFEIS p. 247). The SFEIS (p. 249) states that "*For an estimate of acres affected due to fragmentation of habitat by the network of existing open roads and by the proposed activities refer to the column labeled "Acres within 660' (200 m)" in Table 131.*" Therefore, the ONF underestimates the impact to wildlife and their habitat by only using open roads in their analysis (SFEIS p. 249).

In particular, Project impacts to wildlife resources will be greater when considering expected increases in frequency of use on all motorized routes: open, closed, trail, mix-use, decommissioned, temporary.

Failure to do this more complete analysis on all routes gives a false view of the current wildlife habitat condition within the Project area, and leads to the erroneous conclusion that the ONF is meeting their LRMP wildlife goals and objective and standards and guidelines (3 mi/mi^2). Adding a designated trail system with the promise of better controlling unmanaged OHV use to improve wildlife habitat conditions is questionable and misleading given current conditions due to past decisions and projected outcomes.

Open roads are defined as all roads that the public is able to drive and are generally Maintenance Level (ML) 2-5 roads. The SFEIS (p.57) states that "*Operational Maintenance Levels define the degree of maintenance required for a specific road and the level of service which that road provides, consistent with road management objectives and maintenance criteria (FSH 7709.58, Transportation System Maintenance Handbook*)." Per SFEIS (p. 58), a ML 1 road is "*closed to vehicular traffic…while being maintained at level 1, they are physically closed to vehicular traffic, but may be open and suitable for non-motorized uses*". ML 2 are "*open for use by high clearance vehicles*" while ML 3 are "*roads open and maintained for travel by a prudent driver in a standard passenger car*" and generally not maintained for comfort or convenience. ML 4 roads "*provide a moderate degree of user comfort and convenience at moderate travel speeds*" while ML 5 roads are "*Assigned to roads that provide a high degree of user comfort and convenience. Normally, roads are double-lane, paved facilities."*

To illustrate the road density difference between what the ONF used in their analysis and what the actual road density is on the landscape, the following two maps show the most recent MVUM map of open roads and the Forest Service Administrative Use map (Figure 9), the former which is free, and the latter which can be purchased from the Forest. Both maps are of the same area located west and north of Little Summit Prairie. Neither map shows user-created trails and temporary roads associated with vegetation management projects and decommissioned roads.

The first map is the 2015 MVUM map that shows only open roads that one can legally drive on the forest, and can be anything from a rough 4 wheel drive road to a high speed paved road. The second map is the Administrative Use map that shows the vast majority of roads on the landscape and includes all of the closed ML1roads and the open roads (ML 2-5). Note the dramatic difference in road density when ML 1 roads are added to the map.

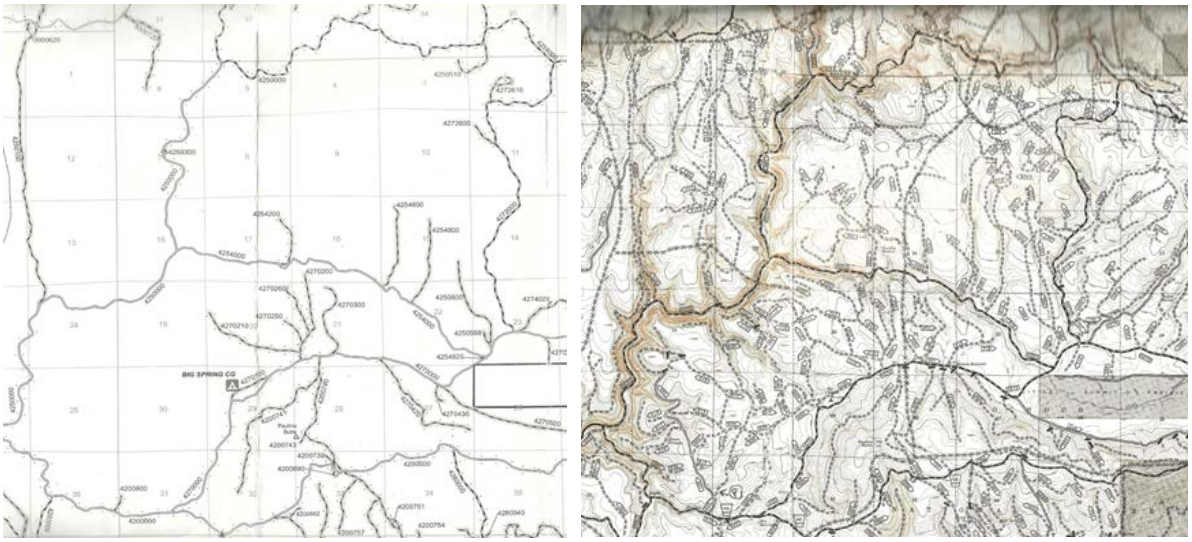

Figure 9. The first map is the MVUM (open) roads while the second map is the Administrative Use map showing all the open and "closed" (ML 1 roads) for the same area.

Currently, the vast majority of roads, routes and trails on the landscape, whether open, closed, decommissioned or user-created are used both legally and illegally. The public is frequently unaware that the 2011 Travel Management Plan limited driving on all roads or they don't have their MVUM maps with them when driving on the forest. Forest users drive these roads, including legal and illegal, and those many users are unaware that some roads are illegal to drive. When forest users see a road without any noticeable restrictions (i.e., gates, signs, berms), they consider it available to drive.

Therefore, to accurately display environmental impacts due to road, route and trail densities, all roads, routes and trails on the landscape must be included in the analysis. Because the ONF only used the 2015 MVUM maps of open roads and proposed Project trails, they significantly underestimated the road density, therefore under estimating the current and projected environmental impacts to wildlife species and their habitat caused by motor vehicle use on all roads, routes and trails on the landscape.

The following table (Table 3) shows the management area and road density standards, and seasonal closures for different big game life history requisites.

Table 3. Data from the ONF LRMP (1989). Closures by Area. (m/m^2 = miles per square mile).

LRMP Management Area	**Road Density**
Winter Range (LRMP 4-255) General Forest Winter Range	1 m/m^2 During closure (12/1 – 5/1) 3 m/m^2 Outside closure (5/1 – 11/30)
General Forest (LRMP 4-259)	3 m/m^2 (all year)
Big Game Seasonal Restrictions	**Ochoco NF**
Winter Range (LRMP 4-255)	Dec. 1 - May 1
Calving Areas (LRMP 4-246)	May 15 - June 30
Rutting (Wallows) Areas (LRMP 4-246)	Sept. 1 - October 15

In numerous cases, the SFEIS road densities violate the open road density standards stated in the ONF LRMP. In addition, the proposed Project operating period is June 1 to September 30 are in direct conflict with the closure dates for elk calving and wallow rutting areas.

To further validate road densities, the 1996 ONF Trail System and Off-Highway Vehicle Management and Development EIS and the subsequent 2003 Roads Analysis for the forest found that road densities ranged from 0 to > 12 miles/miles^2. At the time, average road densities in General Forest and Winter Range designations were 4.01 miles/miles^2 and 3.14 miles/miles^2 respectively. Since then, more roads and trails have been added as part of vegetation and fuels treatment projects.

In the Wildlife Section, the SFEIS (p. 248) states "*ML1 closed roads allow for administrative use but these roads are not included in the disturbed habitat analysis*" (not used to calculate road density). Further, it states there are 140 miles of open ML 3 to 5 roads that are not legal for OHV use, 270 miles of unclassified or other jurisdiction roads, and 669 miles of closed roads (ML 1), **many of which are currently receiving unauthorized OHV use.** The SFEIS (p. 248) states that "*Given the traditional pattern of "open unless designated closed" on the ONF there are currently large areas with moderate to high levels of human disturbance"*. Further, the SFEIS (p. 237) states, "*since miles of existing user-created trails by subwatershed are unknown, these are not accounted for in road/route density estimates and likely would affect flow and sediment regimes*."

The above discussion means that the ONF SFEIS only used open roads from the MVUM map (TMP 2011) to calculate road density per square mile. The ONF failed to discharge its duty to fully disclose and analyze all roads, routes and trails on the landscape, which significantly biased the analysis and underestimated potential Project effects on wildlife species and their habitat. Project impacts to wildlife resources will be greater when considering expected increases in frequency of use on all motorized routes: open, closed, trail, mix-use, decommissioned, temporary. Failure to do this more complete analysis on all routes and increased use with the addition of the Project, gives a false view of present and projected wildlife habitat condition in the Project area and demonstrates that the ONF is fails to meet their LRMP wildlife goals and objectives, and standards and guidelines. Adding a designated trail system with the promise of better controlling unmanaged OHV use to improve wildlife habitat conditions is questionable and misleading given current conditions due to past decisions and project outcomes. When reviewing the above Figure 9, it is obvious that the existing landscape road system let alone the user-created trails impacts all wildlife that rely on the variety of habitats within the Project area.

4. The ONF Failed to Adequately Assess Impacts on Wildlife Populations and Their Habitats.

Wildlife populations are impacted by projects that fragment habitat, sever connectivity between important habitats, and eliminate habitat. In a review of forest fragmentation effects, Reed et al. (1996) found that roads add to forest fragmentation more than clear-cutting by dissecting large patches into smaller pieces and by converting forest interior habitat into edge habitat. The total landscape area affected by clearcuts and roads was 2.5-3.5 times the actual area occupied by these disturbances (Reed et al. 1996). The SFEIS discusses impacts of OHV trails on wildlife including fragmentation of habitat patches (SFEIS p. 244), behavioral changes in response to human use (SFEIS p. 245), and impacts due to noise (SFEIS p. 245).

Habitat fragmentation alters the distribution of wildlife species across the landscape and affects many functions such as feeding, courtship, breeding, and migration. In fact, fragmentation from roads and other human infrastructure has been identified as one of the greatest threats to biological diversity worldwide (Noss 1987, Wilcove 1987, Noss and Cooperrider 1994). Climate change further compounds the threats of habitat fragmentation and biodiversity loss. As animals migrate due to changing climate, landscape connectivity will be increasingly important to best ensure the survival of many species (Hansen et al. 2001; Kettunen et al. 2007).

The proposed Summit Project would cause numerous impacts to wildlife species and their habitats. Species that would be impacted include small mammals, birds, and big game including mule deer and Rocky Mountain elk. In addition, there are important sensitive habitats that would be impacted including old growth areas that provide habitat for species that are dependent on old growth forest habitat characteristics and scablands with very shallow soils and associated plants that have adapted to such unique habitat. OHVs cause both direct and indirect impacts, causing mortality and disturbance to animals, and cumulative loss of habitat for wildlife species (Switalski and Jones 2012). While direct mortality through vehicle collisions is likely low, the far greater impacts are caused by indirect mortality, reduced productivity from disturbance, and habitat loss. OHV use also increases access to more remote habitats for illegal harvest of wildlife (poaching) and is often in areas that are difficult for law enforcement officers to patrol.

Types of OHV impacts to wildlife include increased expenditure of energy due to stress from disturbance, destruction of vegetation that supports wildlife habitat and food, lower reproductive success due to disturbance during critical mating and reproductive periods, greater competition for resources due to population concentrations, and disturbance and displacement of animals. Species with greater sensitivity to motorized disturbance cannot use habitats associated with these areas (physically it's there, but functionally it's unavailable). Species such as big game can partially habituate to predictable activities in certain habitats, but sudden encounters increase stress and cause animals to move to other areas. This movement may cause greater risk of predation (Lyon 1979). Perry and Overly (1976) found in the Blue Mountains of Washington that deer reduced use in habitat 1/8 mile from roads and elk reduced use 1/2 mile from roads.

As an example, Wisdom et al. 2006 evaluated a variety of recreational activities on elk movement. Elk were displaced the furthest by OHVs compared to hiking, mountain biking and horseback riding. Figure 10 displays mean elk movement in response to activity type, with elk moving the greatest distance in response to disturbance from OHVs (Wisdom et al. 2006).

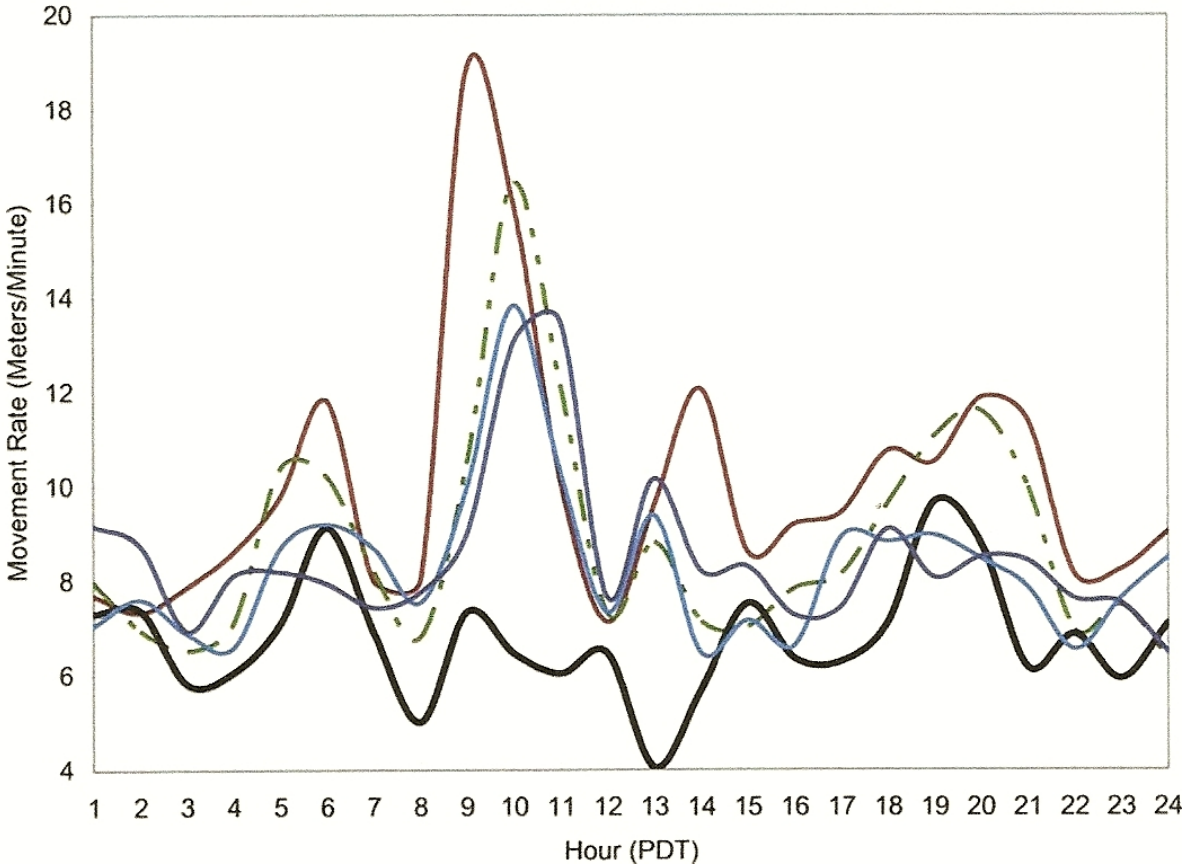

Figure 10. Elk mean movement - no human activity (black), OHV (red), hiking (solid blue), mountain biking (green dot dash) and horseback riding (solid purple)

Rowland et al. (2005) reported that road effects are far more pervasive than originally believed and include such disparate consequences as population and habitat fragmentation, accelerated rates of soil erosion, and invasion of exotic plants along roadways. One author reports that "road systems are the largest human investment and the feature most damaging to the environment" (Gucinski et al. 2001). Summaries of the effects of roads on wildlife habitats and biological systems in general have been compiled by Forman and Alexander (1998), Trombulak and Frissell (2000), Gucinski et al. (2001), Forman et al. (2003), and Gaines et al. (2003).

The ONF analyzed using distance bands to estimate the amount of acres impacted by various distances to motorized routes for each action alternative (SFEIS Tables 131 and 132, p. 250) demonstrating the amount of decreased habitat quality and avoidance due to roads. The SFEIS (p. 249) states that "*For an estimate of acres affected due to fragmentation of habitat by the network of existing open roads and by the proposed activities refer to the column labeled "Acres within 660' (200 m)" in Table 131*." The 200-meter (660 feet) distance from an open road is disturbed habitat for all species. While the analysis provides an initial basis, it is limited as the ONF underestimates the acres of fragmented habitat within the distance bands because it did not include all roads and trails, including those open, closed, and user created, on the landscape that are accessible and driven. Therefore, disturbance from motorized roads and trails and subsequent fragmentation of habitat is even more severe than the SFEIS displays.

The SFEIS estimated noise effects to wildlife from a literature review (SFEIS at 245-247). Because the SFEIS did not analyze all roads on the landscape and it assumed all users would stay on the designated OHV trails, the SFEIS (Tables 131 and 132, p. 250) also underestimated the impacts of noise and disturbance to wildlife. The analysis assumed that OHVs would be at their legal limit of 99 dB. Over 97% of the habitat within 0.89 mile of all routes on the landscape would be impacted by noise by any type of vehicle, thereby reducing habitat quality. At approximately 0.89 mile depending on topography, vegetation, slope wind and other environmental variables, the SFEIS estimates that OHV noise would be reduced to 45 decibels, which the SFEIS considers non-invasive to the casual observer (SFEIS p. 95). "*A decibel level of 30 is characterized as somewhere between 'quiet' and 'very quiet' and equates to a quiet rural area*" (SFEIS p. 95).

Even with just using only open road density calculations, all action alternatives increased impacts to big game, other wildlife species, and the functional availability of their habitats.

5. Rocky Mountain Elk and Mule Deer are ONF LRMP Management Indicator Species and will be negatively impacted by the Ochoco Summit Trail Project.

The SFEIS analyzes information for the Project due to impacts caused by road density and disturbance. It further addresses elk security habitat based on distance from a motorized route of more than a ½ mile and habitat blocks of at least 250 acres in size. The distance banding analysis is only based on the 2015 MVUM open road map and proposed Project trails. As stated earlier, the banding analysis should have included all roads and trails, including open, closed, decommissioned, user-created, and temporary access roads due to vegetation management projects to fully assess the effects and harm to big game caused by the motorized use of roads, routes and trails. In fact, the SFEIS (p. 310) acknowledges that "*this project would increase motorized route density and would reduce the effectiveness of security cover within the Project area*".

In contrast, the Hydrology and Aquatics resource section (SFEIS p. 218) reported total road densities within subwatersheds exceeding the LRMP standards and guidelines. For example, both open and total road densities were compared between Alternatives 2 and 5 (Table 114) for 9 subwatersheds, but neither were compared to the existing condition of the No Action Alternative. Also not included in the Table 114 estimate was total road density for closed, decommissioned, user-created trails and temporary roads due to vegetation management projects. Table 116 (SFEIS p. 221) compares Alternatives 2 and 5 (but we're not sure since the label is Alternatives 3 and 5 but the table shows 2 and 5) of open, total and open with the OHV trail and total with the OHH trail road densities within 300 feet of streams for the same 9 watersheds. All action alternatives violate the LRMP road density for total road densities and range from the lowest road/trail density of 4.2 mi/mi^2 in the Elliot Creek drainage in Alternative 5 to 8.8 mi/mi^2 in the Lower Deep Creek subwatershed in Alternative 2.

Data in the SFEIS is not consistent and or well defined within resource areas and between resource areas (e.g. Hydrology and Aquatics versus Wildlife), thereby making it very difficult to understand existing conditions and Project effects. For example, open road densities, total road densities, and open and total road densities within 300 feet of streams were calculated sometimes at the subwatershed level and sometimes at the watershed level, and in many cases did not show the existing condition for the No Action Alternative. Reviewing Tables 9, 114, 116, and 143 (SFEIS p. 59, 218, 221 and 294 respectively)

leave the reviewer confused on why subwatershed data is not displayed at the subwatershed level while at the watershed level in Table 143, only open road densities are shown and includes the No Action Alternative. What is obvious though, are the high levels of total road densities in all subwatersheds that violate LRMP standards and guidelines.

This discussion on road densities and the confusion of estimating impacts at the subwatershed level is important because of the huge impacts that roads and motorized trails have on Rocky Mountain elk and mule deer. They are called "management indicator species" (MIS) because when the LRMP was written, "*a group of wildlife species were identified as Management Indicator Species (MIS). These species were selected because their well-being could be used as an indicator of other species dependent upon similar habitat conditions. Indicator species can be used to assess the impacts of management actions on a wide range of other wildlife with similar habitat requirements*" (SFEIS p. 274). In other words, they are supposed to be the "bellwether" species that indicate how the rest of the wildlife species are doing that occupy similar habitats.

Numerous authors have reported on the effects of roads to Rocky Mountain elk, one of the MIS. Rowland et al. (2005) summarized the following impacts of roads on Rocky Mountain elk:

1. Elk avoid areas near open roads. A plethora of studies have demonstrated an increasing frequency of elk occurrence or indices of elk use, such as pellet groups, at greater distances from open roads (defined here as any road where motorized vehicles are allowed). This response varies in relation to traffic rates (frequency) (Johnson et al. 2000, Ager et al. 2003), the extent of forest canopy cover adjacent to roads (Perry and Overly 1977, Lyon 1979, Wisdom et al. 2004b), topography (Perry and Overly 1977, and type of road (e.g., improved versus primitive; Perry and Overly 1977, Lyon 1979, Marcum and Edge 1991, Rowland et al. 2000, Lyon and Christensen 2002, Benkobi et al. 2004), which also correlates with traffic rates (frequency). Responses may also differ between sexes, with bull elk demonstrating a stronger avoidance of areas close to roads than do cow elk (Marcum and Edge 1991). On a larger scale, entire ranges can be abandoned if disturbance from traffic on roads and the associated habitat loss and fragmentation exceed some threshold level. The ultimate effect of displacement of elk, by motorized traffic as well as other disturbances, is a temporary or permanent reduction in effective habitat for elk. Concomitant with loss of effective habitat are reduced local and regional populations (Forman et al. 2003).

2. Elk vulnerability to mortality from hunter harvest, both legal and illegal, increases as open road density increases. Survival rates of elk are reduced in areas with higher road density (Leege 1984, Gratson and Whitman 2000a, Weber et al. 2000, Hayes et al. 2002, McCorquodale et al. 2003). Closing roads offers more security to elk and may decrease hunter densities (fewer hunters may be willing to hunt without vehicle access). Poaching losses may decrease when roads are closed (Cole et al. 1997).

3. In areas of higher road density, elk exhibit higher levels of stress and increased movement rates. Higher levels of physiological indicators of stress, such as fecal glucocorticoids, have been observed in elk exposed to increased road density and traffic on roads (Millspaugh et al. 2001). In Rowland et al. (2005), the energetic costs of moving away from disturbance associated with roads may be substantial (Cole et al. 1997).

The SFEIS used distance banding to evaluate elk security habitat impacted by motorized disturbance. While distance banding is an appropriate method in evaluating elk response to disturbance, the ONF used an estimate of elk security habitat by Hillis et al. 1991. That definition of elk security habitat may be an inappropriate and out of data extrapolation. The ONF did not explain why the definition of elk security habitat used by Hillis et al 1991 would be applicable to the Project area, or why the agency chose to use Hillis et al. (1991) over other more recent studies of elk security habitat. Hillis et al. 1991 (referenced in Proffitt et al. 2012; Ranglack et al. 2016) defined elk security habitat as 250 acres or more > .5 miles from a road in western Montana in an area with contiguous conifer forest. When Hillis et al (1991) conducted their study roads were not differentiated whether they were open, closed, or decommissioned. Back then a road was a road if it was driven and travel management planning had not yet occurred.

With many current forests attempting to manage off road use and develop and implement travel management plans, it adds complexity on interpreting how animals respond to motorized routes. More recent studies of elk movement in response to motorized routes (Proffitt et al. 2012; Ranglack et al. 2016) used open road densities to evaluate elk movements during archery and rifle seasons in Montana. They evaluated other variables including canopy cover and how intermixed private and public lands were in the study areas. These two recent studies showed that motorized routes were the strongest variable that determined elk movement, even more so than canopy cover during hunting seasons. Ranglack et al. (2016) recommended significantly greater habitat protection for elk in order to maintain elk on public lands with the following variables and to manage for areas 1) that are at least 5,000 acre blocks of elk security habitat, 2) greater than 13% canopy cover, and 3) greater than 1,535 m from motorized routes. The ONF Project area is a mixed conifer forest located generally in canyons and draws associated with Class I through IV streams and having shrub-scablands occupying the ridge areas between forested areas, and more closely approximates habitat studied by Proffitt et al. (2012) and Ranglack et al. (2016). The one main difference is that topography in the Ochocos is gentler and has higher road densities that are driven by forest users, than the areas studied in Montana. Based on numerous trips to the region, in my professional judgment, southwest Montana has a similar mosaic of habitat more like the ONF of open shrub-grasslands and coniferous forest, but has generally much lower road densities than the ONF.

Applying the Hillis et al. 1991 definition of elk security habitat definition to this area significantly underestimates the impacts to elk and elk habitat availability. Data can be manipulated to either emphasize or minimize the apparent effects of a project. Data and reports can be "cherry-picked" to emphasize an argument that the proponent wants to make. This Project is an example of where information was presented to look like the analysis is objective but in fact fails to demonstrate how the Project minimizes impacts of the proposed OHV trail system on elk security habitat. For example, Table 144 (SFEIS p. 296) shows acres of elk security area greater than ½ mile from any open motorized routes for the no action and all action alternatives by 5th field watersheds. When these action alternatives estimates are lumped into the larger watersheds, the impacts seem relatively minor.

Even with only analyzing open road density impacts on elk, Table 144 (SFEIS p. 296) showed a decrease in elk security habitat acres for all action alternatives in each of the 9 - 5th field watersheds. Table 1 on p. 5 of this document is another way to show the data displayed in SFEIS Table 144. These tables showed a significant decline in elk security habitat in the Deep Creek 5th field watershed. Currently, less than 7% elk security habitat remains within the 54,561-acre watershed. The "Environmentally Preferable Alternative" (Alternative 5 plus portions of Alternative 2) impacts are not available, as the ONF did not

provide any environment analysis on its selected alternative. However, Alternative 5, which represents the majority of the Environmentally Preferable Alternative, shows a decrease of 73.5% in available elk security habitat. There were also 14.6% and 17.3% declines in elk security habitat in Upper Ochoco Creek and Lower Beaver Creek subwatersheds, respectively.

The elk security habitat acres shown in Table 144 and the impacts shown above are predicated on the use of the 2011 Travel Management Plan and the annual Motor Vehicle Use Map showing only open roads (ML 2-5), which ONF used to calculate roads/routes per square mile. As described above, the landscape is covered with roads, trails and other routes that are physically open for motor vehicle use. A more appropriate analysis is to include all roads, trails and other routes that are physically open and the public drives in order to estimate impact on elk security habitat, and would show much more degradation of elk security habitat from baseline conditions to all action alternatives.

The SFEIS (p. 260-261) discusses the amount of elk security cover and shows the amount of acres greater than ½ mile from a road and greater than 250 acres in size. Even with these much smaller blocks of elk security habitat compared to the recommendations by studies in Montana for larger blocks, all action alternatives decrease the amount of elk habitat from the No Action alternative. What is not shown is that, already 87% of the Project area, even with the No Action Alternative, which is entirely in elk summer range, has been compromised by the "open" roads, and fails to account for the ongoing impacts of closed, decommissioned and user-created roads/trails. If all roads were used in the elk habitat analysis for the action alternatives, like those road densities identified above (SFEIS p. 221), there would be a much greater impact to habitat than in the existing condition. Further compounding the existing condition with a new OHV trail system will further diminish and harm elk security habitat and elk populations.

Given the extrapolation of the Hillis et al (1991) paradigm of a heavily forested area and the new information from habitats more similar to the ONF, in my professional opinion, it is more appropriate to refine the elk security habitat definition to a banding to at least an interval of > .75 miles (3,960 feet) and > 250 acres. If these new estimates for elk security habitat were evaluated, the existing condition would likely show that there is significantly less elk security habitat. Using the above-suggested banding interval would better evaluate impacts to elk security habitat given the lack of contiguous conifer forest. Furthermore, if all roads, routes and trails on the landscape, that are currently being driven were incorporated and modeled using the suggested distance banding criteria, the effects to elk security habitat would be even more significant.

Wisdom et al (2006) reported that the more frequent vehicles in elk habitat in a 12 hour period, the greater distance elk moved in response to the vehicle disturbances (Table 4).

Table 4. Elk Movement in Response to Vehicle Trips in a 12 Hour Period

Traffic Volume	Vehicles Per Time	Mean Distance of Elk Movement
Low	< 2 vehicles per 12 hours	869-880 m
Moderate	2-4 vehicles per 12 hours	909-1032 m
High	> 4 vehicles per 12 hours	1103-1560 m

The SFEIS estimated 5,000 visitors (SFEIS p. 290) participating in the OHV trails in the Recreation section, and 15,000 visitors (SFEIS p. 387) by 2020 in the Botany section. Assuming an average of the two estimates yields an estimated 10,000 visitors during one season of use, and dividing by the number of days in the riding season of 122 days (June 1 to September 30), results in an average of 82 visitors per day. While seasonal use may be higher on weekends and lower on weekdays, regardless, a mean of 82 visitors per day is a lot of motorized activity. Fisher et al. (2002) reported that the median distance traveled (including motorcycles, ATVs and 4x4) of miles traveled on OHVs by users during their last outing was 50 miles. Therefore, on any average day on the ONF, there could be at least 40 vehicles on each of the 2 implementation areas. An OHV trail system that produces that level or more of motorized vehicles will significantly alter the available habitat and displace elk.

The SFEIS does not comply with the General Forest road density standard of 3 miles per square mile and therefore continues to degrade and fragment big game wildlife habitat, failing to assist the State of Oregon in meeting management objectives and goals for big game, and fails to avoid or minimize impacts by development and implementation of the OHV Project. Further, it appears that the above rough calculation of visitor days would decrease and possibly even eliminate elk of the Project area.

6. The FEIS Failed to Incorporate and Acknowledge the Importance and Protection of Strategy Habitats or Species in 1) the Forest Service Terrestrial Resource and Conservation Area Strategy (TRACS) and 2) With Partner Agencies such as the ODFW Oregon Conservation Strategy (ODFW 2006), including the Blue Mountain BM-04 Conservation Opportunity Area as Important Strategy Habitat and Species to be Conserved, Restored and Enhanced.

The Project is inconsistent with the protection and restoration of key strategy species and their habitats in the North Fork Crooked River basin and Big Summit areas in the Region 6 TRACS and the ODFW Oregon Conservation Strategy (OCS). These same overlapping conservation and restoration priorities are also on The Nature Conservancy Ecoregion Prioirities, the Eastern Oregon Bird Conservation Plan, and the Interior Columbia Basin Ecosystem Management Project plant biodiversity area.

The USDA Forest Service PNW Region 6 developed the TRACS as a framework for the region and forests to identify key habitats and wildlife species to protect, conserve, restore and enhance habitats for these landscapes (USDA 2012) (Figure 11). The TRACS theme is "protect the best and restore the rest". It's a comprehensive planning tool to identify the most important terrestrial species, habitats and watersheds by R6 ecoregion, and provides examples how this information can be used to integrate restoration projects and accomplish multiple objectives simultaneously. The vision of TRACS is to strategically conserve, restore and enhance high-quality habitat and improve less-healthy ecosystems with a general theme of "Protect the best and restore the rest". It includes collaboration with other entities and partners, and coordinated actions to benefit priority species and habitats in key watersheds. It was developed by Region 6 staff and biologists, botanists, and other natural resource and planning staff.

In the section on Minimum Roads Analysis, the guidance to the forests in Region 6 was that TRACS should be a primary consideration when completing a Minimum Roads Analysis. Roads are a major threat to priority species and habitats, and cause disturbance to 52% of the TRACS Priority Vertebrate Species. Information in the TRACS databases is to identify species and areas that are most important to protect with respect to roads, as well as areas where access is important to conduct restoration efforts

(USDA 2012). The priority area on the ONF includes the Upper North Fork Crooked River watershed including Big Summit Prairie and tributary areas and includes an overlapping Aquatic Restoration and Conservation Strategy (ARCS) area. For example, TRACS identifies the Upland Sandpiper as a species of concern because it historically nested in the Blue Mountains Ecoregion in montane meadows from 1,000 to 30,000 acres at 3,400 to 5,060 in elevation and is a Region 6 sensitive species. Both the Upper and Lower North Fork Crooked River watersheds were identified as important habitats to protect.

TRACS also identified elk as a priority vertebrate species in the Blue Mountain and East Cascade ecoregions. TRACS recommended that the Blue Mountains Elk Model (the joint ODFW- Forest Service habitat model) be used to identify areas of the highest value for habitat enhancement or restoration. TRACS also recommended that areas where elk populations numbers are below state game management unit objectives (i.e. the Ochoco Wildlife Management Unit where the Summit OHV Project is proposed), that projects should be implemented to reduce open road densities where they are excessive and maintain adequate levels of cover (USDA 2012).

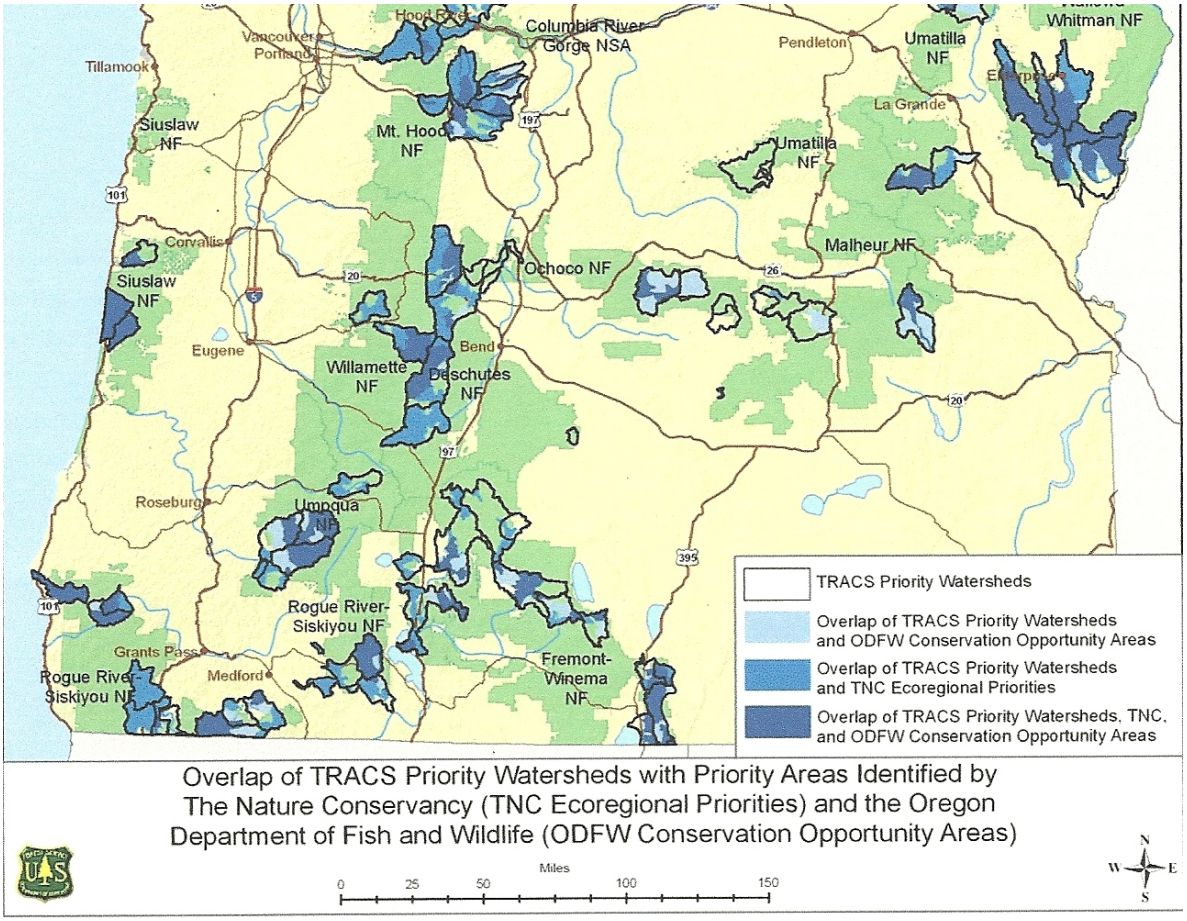

Figure 11. The OHV Project overlays a key TRACS priority watershed, ODFW's conservation opportunity areas, and The Nature Conservancy Ecoregion priority area for protection (USDA 2012).

TRACS also identifies mule deer as a priority vertebrate species in all ecoregions east of the Cascade crest (Forest Service 2012). Both Deep Creek and the Upper North Fork Crooked River were cited as

priority watersheds for protection and restoration. Threats to mule deer include roads (mortality, disturbance, barrier), poaching, recreation (motorized and non-motorized), fire exclusion and habitat loss due to invasive species (USDA 2012).

Similar to the elk population decline seen in Figure 1 (page 3 of this document), mule deer in the Ochoco Wildlife Management unit are also on the decline and are well below the ODFW management objective (Figure 12).

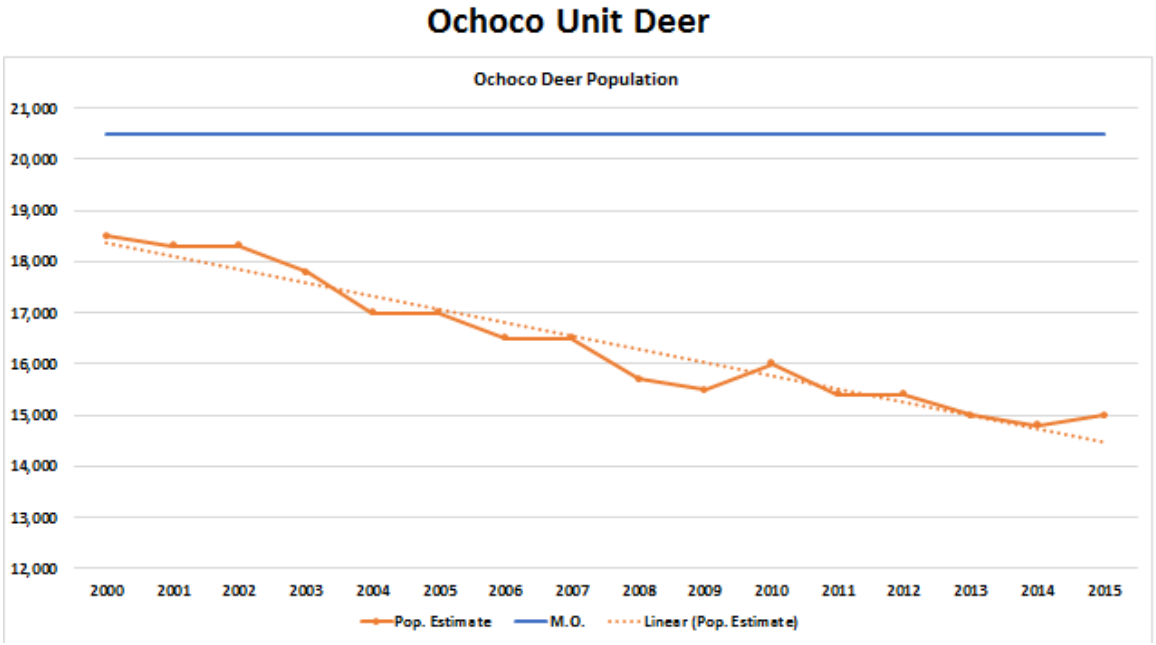

Figure 12. Ochoco Management Unit mule deer population estimates, 2000-2015. The orange line is the annual population estimate for elk while the "management objective" is the blue line (data from Greg Jackle, ODFW District Wildlife Biologist, pers. comm.).

TRACS states that mule deer are "especially sensitive to disturbance and direct mortality from roads. Impacts from different levels of access and recreational use should be considered alongside the need for hiding cover. Researchers have established that unlike elk, mule deer do not flee long distances…Permanent or seasonal road closures may be needed to protect key winter range and fawning areas…New recreation developments may impact mule deer, especially those that might influence movement patterns across the landscape such as trails…Off-highway vehicles trails and cross-country trail have increased exponentially in the past few decades, and can displace mule deer into unfamiliar or less productive habitat. High open road densities also provide increased opportunity for poaching" (USDA 2012).

TRACS identified several priority habitats: aspen stands, springs and seeps in all ecoregions. TRACS specifically identified priority watersheds in the Crooked River and Deep Creek, and late-seral ponderosa pine habitat with Deep Creek and Upper North Fork Crooked River as priority watersheds. Elk and mule deer were also identified as priority social/economic vertebrates for late seral ponderosa pine habitat.

In addition, the Blue Mountain 04 (BM-04) of the OCS is a Conservation Opportunity Area that recognizes the importance of the North Fork Crooked River (a Wild and Scenic River) and its tributaries, and the Big Summit Prairie, one of the largest montane wetlands in eastern Oregon (ODFW 2006, 2016). Key habitats include aquatic/riparian areas, wetlands and wet meadows. Further, this same area is also recommended for protection in the American Fisheries Society Aquatic Diversity Areas, the Eastern Oregon Bird Conservation Plan, the Interior Columbia Basin Ecosystem Management Project plant biodiversity area, and The Nature Conservancy Ecoregion Priorities.

The fundamental issue is that the USFS TRACS, ODFW OCS and others have designated this area of the Ochocos as a priority area for protection, conservation and restoration. The ONF failed to consider and logically apply Regional direction to use TRACS and ARCS when proposing and locating projects. The analyses to locate and implement the Summit Trail project using TRACS would have quickly revealed how inconsistent the OHV project is with Region 6 direction for conservation, restoration and enhancement. This area should receive a higher level of protection and conservation in recognition of the important wildlife species and habitats that occupy this special area, rather than less protection. By failing to apply the TRACS strategy and working with partners such as ODFW, the ONF misses an important opportunity to protect and restore the Big Summit Prairie area and North Fork Crooked River and its tributaries. Given the potential damage by motorized recreation, plans for the area should be to de-emphasize motorized recreation and implement a more appropriate strategy that is consistent with TRACS to protect, conserve and restore fish and wildlife. For example, other projects that emphasize recreational pursuits such as wildflower photography, bird watching, nature study, hiking, dispersed camping, and horseback riding would be more aligned with conservation of these important resources. Development of this OHV system will harm and displace fish and wildlife resources and is inconsistent with Region 6 TRACS and ARCS guidance to protect and restore this unique and sensitive area.

7. The ONF Designates a Large Project Area that Dilutes Project Effects.

The Summit Trail Project area of 301,580 acres covers such a vast area of the Forest that it dilutes and disguises the numerous effects to fish and wildlife species and their habitat. When the Deschutes Provincial Advisory Committee reviewed potential areas that could be used to analyze potential OHV trail sites, working group members never intended for such a large area to be developed anywhere on the ONF unless the ONF realistically could significantly improve wildlife habitat as outlined in the Working Group Recommendations (Glen Ardt, retired ODFW biologist and former Deschutes PAC member, pers. comm.) One of the agreements in the PAC was that the forests were expected to meet LRMP standards and guidelines for road densities by effectively closing roads (physically block, not just a paper exercise). The large size of a community consensus area was to provide flexibility to find a place to put in a smaller scale OHV trail system, not encompass such a huge geographic area. By doing this approach of a large OHV trail system over a huge area, the ONF misused the guidance from the PAC and used inappropriate analyses to conclude that there is a small impact to resources.

The Project area is further divided into the OHV Management Area (MA) that encompasses the Implementation Area (IA) for each action alternative (SFEIS p. 28). The SFEIS, while providing small-scale maps for each action alternative MA and IA, did not provide acreages for any action alternative MA or IA (SFEIS Maps). The OHV MA would serve as the overall management area for motorized travel. The IA would serve as the focus area for trails, education, law enforcement, and monitoring.

The ONF cites 40 CFR 1508.25 "Scope" which states the EIS must consist of a range of actions, a range of alternatives (including no action), and impacts to be considered. The CFR does not define the geographic scale of the Project area. There is no regulation that states that a project has to use a huge watershed area to analyze Project effects.

The OHV MA for Alternative 5 encompasses approximately 35% of the total Project area (our best estimate given the small scale map provided in the SFEIS Maps) that is predominately the General Forest MA. If the ONF used GIS to conduct its resource analysis of Alternative 5 OHV MA within portions of the 9-watersheds, the analysis results would show significant impacts to fish and wildlife species and their habitat simply because the impact analysis would be restricted to approximately 100,000 acres instead of the vast Project area acreage of 301,580.

For example, the ONF relies on the MVUM maps, the Project trails and road densities, and the 5th field watersheds to display Project effects to elk security habitat. Table 144 (SFEIS p. 296) shows the 9 watershed effects by alternative. It shows that the Deep Creek watershed is significantly impacted by all action alternatives plus Lower Beaver Creek and Upper Ochoco Creek watersheds are moderately impacted by the action alternatives. In applying the above premise where the OHV MA is analyzed within portions of the 9-watersheds and analyzing all roads, routes and trails on the landscape, the results would show significant impacts to elk security habitat across all 9-watersheds thereby revealing far more accurate impacts to elk security habitat associated with implementing the Summit Trail Project. We do not have access to GIS to display the above describe analysis method to show actual Project impacts.

Another example is how shrub-scabland habitat and impacts caused by the Summit Trail Project are marginalized by the large size of the Project area. A small impact zone was utilized to determine Project effects. The SFEIS (p. 375) states there are 23.6 miles of trail proposed in Alternative 5 in shrub-scabland habitat type. By using only a 10 foot width for trail disturbance, only about 28.6 acres of the 48,447 acres will be impacted in scabland habitat (less than 1%). Yet, the LRMP describes scablands "*as among the most fragile ecosystems on the Ochoco National Forest. Damage to the soil and vegetation as a result of management activities is nearly impossible to mitigate. This is a result of their having very shallow soils which are subject to severe water saturation and frost heaving during winter, thus making revegetation virtually impossible*"(LRMP 4-197). Figure 13 depicts a scabland area with an old roadbed that is proposed to become an OHV trail. The road to the left is supposed to stay "closed".

Figure 13. Scablands with "closed" roads. The road straight ahead is a proposed OHV trail while the road to the left is supposed to remain "closed".

A project design criteria was developed to protect TES plant habitat, by closing the trail system when resource damage occurs such as rutting and runoff. However, once the damage is done it is permanent.

The small impact zone is based on the direction given to the Forest IDT, which was to assume all riders will stay on the designated trail and to base the analysis of Project effects to the narrow linear trail feature (Barb Franano, Ochoco Forest retired fish biologist, pers. comm.). OHV monitoring results, OHV videos on the internet, research (Kiely & Kassar 2007), and first-hand experience show that OHV riders prefer to ride off-trail. Given the openness of the shrub-scabland habitat and the many acres of trail through this type habitat, it is a given that a percentage of riders will "play" off trail. Even if it is only a few riders, many acres of this habitat type will be destroyed.

These are just a couple of examples of how a huge project area is used to display a small impact on a linear feature that is only assumed to be 10 feet in width. It leads to a biased conclusion that the OHV trails will have little impact.

8. The Project Design Criteria and Mitigation Measures are Insufficient to Mitigate for Impacts Caused by the Summit OHV Trail System to Sensitive Wildlife and Their Habitats, and Botanical Resources.

The Project Design Criteria (PDC) (SFEIS p. 29-37) elements do not comply with LRMP Standards and Guidelines and are insufficient to mitigate the impacts of the Summit Project.

For example, as discussed in 1A. Elk Calving and Wallow areas, the LRMP standards and guidelines state that projects are to:

1. Protect the character of elk calving sites. Minimize disturbance from human activity during calving season (approximately May 15 to June 30).
   Protect wallows during rutting season (September 1 to October 15) (LRMP 4-246).

2. Antelope: Manage antelope habitat on the Forest in accordance with ODFW population objectives (LRMP 4-248). While ODFW does not have specific population management objectives, they monitor for abundance annually and set harvest tags based on monitoring.

The SFEIS (p. 36) states the PDC for big game does not allow construction, de-construction and maintenance activities for May 15-June 30 within elk calving areas. However, the PDC does not restrict OHVs riders using trails during the month of June when elk and other big game species are dropping their young. Riding OHVs during the calving, fawning and kidding period will highly impact these game species by displacing them from high quality birthing sites due to disturbance from OHV activities, into less functional sites (Lehman et.al. 2015), and will likely result in reduced productivity of the population. The same is true for timing restrictions for known elk wallows. Restrictions for trail construction, reconstruction, decommissioning and maintenance activities are applied from September 1 to October 15 for known elk wallows, but do not prohibit OHV trail use from September 1-30, allowing disturbance impacts to elk during the mating season by OHV riders.

The PDCs for TES plants states that the Forest Service will conduct surveys prior to trail construction and disturbance (SFEIS at 33). Since the release of the 2013 DEIS, the ONF has known the identified OHV routes. As is common with vegetation management projects, site-specific surveys are completed before

release of the environmental documents. Between issuance of the DEIS and SFEIS (a period of 3 1/2 years), these trails could have been surveyed to display Project effects for public review and comment. By delaying surveys until after the NEPA process is completed, the survey routes could substantially change, depending on species and habitats encountered, thereby changing Project design and effects without public review and comment.

Mitigation measures are implemented to compensate for Project impacts. Mitigation is the so-called "last defense" or "last resort" when and where there is no opportunity to avoid, minimize, or reduce the impact. The agency failed to consider Best Management Practices (BMPs) identified in OHV Best Management Practices for Forestlands (Switalksi and Jones 2012). Only once the impacts have been avoided or minimized should the agency establish site-specific management actions to reduce or mitigate remaining impacts.

For example, the mitigation measure to protect sensitive plant habitats with a split rail fence (SFEIS p. 38) is insufficient. It is unclear in the SFEIS if the purpose of the fence is to protect the plants or to contain the OHV riders. The companion element for monitoring is absent. Given that there are Regional Forester sensitive plant populations, it is more appropriate to avoid and eliminate the OHV trail and staging areas to meet Forest Service management direction. All action alternatives will increase the spread of noxious and invasive weed species, leading to further deterioration of native plants, and fish and wildlife habitat (see discussion in #1F).

The ONF fails to sufficiently provide adequate PDC and mitigation measures, let alone responsible monitoring elements to meet CEQ regulations for minimizing Project affects to forest natural resources.

9. The SFEIS Fails to Address the Impacts of Illegal OHV Use.

The SFEIS (p. 60) states that there are "*user-created motorized trails within the 33 subwatersheds, but it was not calculated for each subwatershed. According to the "COMAC" inventory there are potential routes identified; 188 miles of ATV trails, 87 miles of motorcycle and 159 miles of shared use. Approximately 40% of the routes identified are on existing open roads*." Therefore, there is an estimated 435 miles of trails, of which approximately 260 miles are cross-country user-created trails. The SFEIS (p. 79) then contradicts the previous statement and reports that "*approximately 700 miles of user created OHV routes, including open and closed roads and user-created trails have been identified in the Project area*". If we assume that 40% are on existing open roads, then approximately 420 miles are cross-country user-created trails. That is a substantial number of motorized trail miles that will impact habitat and wildlife populations.

There is no analysis anywhere in the SFEIS of user-created trails and their effects to natural resources. See Discussion in Issue #2 for lack of disclosure of open, closed, decommissioned and user-created trails on the landscape and their effect to all natural resources.

One study of OHV use on public lands reported that increased use of All Terrain Vehicles (ATVs), even with a small percentage of riders who travel off roads and trails, can cause considerable detrimental impacts on the natural resources around them (Meadows et al. 2008). These effects from irresponsible OHV users are impossible to contain these OHVs are powerful machines and can travel many miles quickly and damage sensitive resources easily.

As an example, the ONF has a "managed" motorized travel area on the Crooked River National Grassland that has been in place since 1992 at the Henderson Flat OHV area. Illegal trail and road development by OHV and 4-wheel drive (4WD) users has been rampant in the last 24 years and has negatively impacted deer and antelope winter range, and damaged soils, vegetation and water quality on the Grassland (Figures 14-17). The same is true for McKay Creek on the forest, despite efforts by fisheries staff of the forest to restore the drainage.

Figure 14. "Closed" OHV road

Figure 15. Illegal OHV trails in Skull Hollow

Figure 16. Illegal 4WD road near Skull Hollow

Figure 17. Illegal motorcycle trail Lone Pine

Figure 18 and 19. Soil erosion and loss of habitat near McKay Creek from illegal OHVs. Photos by Wayne Elmore.

Adding a new OHV area of this magnitude will further stretch the very limited law enforcement resources already in place (One Law Enforcement Officer oversees one million acres).

The SFEIS argues that the Summit Trail Project would better distribute OHV use but in fact, these illegal roads and trails have never been restored, and are rarely if ever enforced, the latter of which was the intent of the 2011 Travel Management Plan. These illegal trails continue to degrade water quality, increase sedimentation, damage sensitive riparian and wetland habitats, spread noxious and invasive weed species, and impact important year-round and big game winter range for elk, mule deer and antelope. In fact, the new OHV Project would take the already limited law enforcement and direct it at these new trails, further shifting resources away from the illegal trails, rampant throughout the remainder of the Forest and Grassland.

Conclusion

All the actions associated with the Summit Trail Project are discretionary, including the choice to implement the Project, to use MVUM roads as trails or construct new trails or convert closed and decommissioned roads into OHV trails, and to locate proposed trails through or away from sensitive habitats. By selecting Alternative 5 modified by Alternative 2, the ONF has chosen to not avoid or minimize impacts to many sensitive habitats including elk security habitat, elk calving and wallows, shrub scablands, late successional old growth areas, Class I - IV streams, riparian areas, wetlands, wet meadows and many others. In fact, by not avoiding or minimizing impacts to shrub scablands and old growth, the ONF must do Forest Plan Amendments to allow new motorized trails in these sensitive habitats, another discretionary choice that fails to avoid or minimize impacts to important natural resources.

As a professional wildlife biologist for 26 years with the USDA Forest Service, 4 years with the Oregon Department of Fish and Wildlife and 4 years as a Professional Consulting Wildlife Biologist, I have had ample opportunity to draft environmental documents for public review and comment. I have always strived to make my data, its analysis and conclusions, clear and unbiased for public understanding.

My review of the ONF Summit Trail System Project was challenging at best as the basic data used between resource areas was inconsistent and in numerous cases misleading. Most of the analyses were completed with GIS and desktop computers, and with little or no field verification, and surveys. Presentation of the contents of the SFEIS was NOT in a clear and open fashion so the public reader, let alone a Professional Wildlife Biologist, could readily understand and find logical conclusions. I had to have numerous documents open to follow the data, analyses and discussion that may or may not have led to a rational conclusion.

Finally, I find it unconscionable that the Forest Service did not fully disclose the entire Project record at the SFEIS release so the public would have the full 45 days to review and provide timely objections. I also find it inexcusable that the SFEIS was full of inconsistent disclosures and data within and across resource discussions in Chapter 3. In an EIS, Chapter 3 is the most important section of the environmental document, in that the existing condition is analyzed and objectively compared to all action alternatives to fully disclose direct, indirect and cumulative effects of the proposed Project.

The Summit Trail System SFEIS fails to fully disclose effects per NEPA to all natural resources. Instead, it seems the document was crafted to facilitate a decision to implement an OHV trail system on the ONF.

Respectfully,

/s/ Michael G. Gerdes (verifiable signature available upon request)

Michael G. Gerdes
Wildlife Biologist (Retired)

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Qualifications:

- Extensive knowledge of ecosystem management principles including a comprehensive understanding of land and resource management principles and practices
- Significant knowledge & experience in settlement negotiations with proponents and all stakeholders
- Highly effective in managing staff, administering fiscal resources and information technology to accomplish agency mission & objectives
- Effective skills, ability & knowledge to handle multiple resources, balance many programs and projects, set priorities, organize personnel, make decisions and keep to time schedules to meet program goals, all of which are necessary for agency accountability
- Highly effective oral and written communication skills
- Significant knowledge & experience in all hydropower (including transmission line) resource (aquatic, terrestrial, recreation, aesthetic, land use, cultural, etc) issues, study design & methodology development, study implementation, FS independent analysis of study results, mitigation development and defining rationale for substantial evidence supporting FS 4e conditions, critical review and comment on license applications, draft & final environmental assessments and/or impact statements, and new license review, comment and rehearing submittals if appropriate

Education:

A.S.	Wildlife Mgmt 1978	College of the Siskyous	Weed, CA
B.S.	Wildlife Mgmt 1982	Humboldt State University	Arcata, CA

Professional Profile:

4/12 - 12/15	Consulting Wildlife Biologist
10/02 - 4/12	Zone Terrestrial Resource Specialist, GS-401-12 Regional Hydropower Assistance Team Regional Energy Team
11/98 - 10/02	Wildlife & Terrestrial Resource Specialist, GS-401-13 National Hydropower Assistance Team
2/98 - 11/98	Wildlife & Terrestrial Resource Specialist, GS-486-12 Regional Hydropower Assistance Team
2/96 - 2/98	Forest Wildlife Biologist, GS-486-12
11/92 - 1/96	Forest Wildlife Biologist, GS-486-11
3/90 - 10/92	Spotted Owl Coordinator, GS-486-9
5/89 - 2/90	OR Fish & Wildlife Biologist
3/87 - 4/89	OR Fish & Wildlife Tech
4/86 - 3/87	OR Fish & Wildlife Tech
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UNITED STATES DISTRICT COURT
DISTRICT OF OREGON
PENDLETON DIVISION

GREATER HELLS CANYON COUNCIL, **OREGON WILD**, **CENTRAL OREGON LANDWATCH**, **SIERRA CLUB**, **GREAT OLD BROADS FOR WILDERNESS**, and **WILDEARTH GUARDIANS**,

Plaintiffs,

v.

HOMER WILKES, in his official capacity as Undersecretary for Natural Resources and Environment; **GLENN CASAMASSA**, in his capacity as Regional Forester for Region 6; and the **UNITED STATES FOREST SERVICE**,

Defendants,

AMERICAN FOREST RESOURCE COUNCIL, and **EASTERN OREGON COUNTIES ASSOCIATION**,

Defendants-Intervenors.

Case No. 2:22-cv-00859-HL

DECLARATION OF DR. BEVERLY LAW

I, Beverly E. Law, declare as follows:

INTRODUCTION

1. My name is Beverly E. Law. I reside in Corvallis, Oregon. I have personal knowledge of the matters stated herein and if called as a witness I would and could truthfully testify thereto.

2. I am a Professor Emeritus of Global Change Biology and Terrestrial System Science in the Department of Forest Ecosystems and Society at Oregon State University. I have been a tenured professor at Oregon State University since 2003. I make this declaration in my personal capacity.

3. I am a fellow at the American Geophysical Union and an Aldo Leopold Fellow.

4. My research focuses on the effects of climate change, fire, and management on ecosystem carbon and water cycling, addressing issues such as vulnerability of forests to drought-related mortality, and ecological implications of human actions intended to minimize drought and fire effects.

5. I am an author or co-author of over 240 peer-reviewed publications. I have led teams that have explored our understanding of the interactions between ecosystems and the atmosphere, and regional analysis of carbon and water cycling and potential vulnerability of forests under future climate.

6. I served as the Science Chair of the AmeriFlux network of 100+ land-atmosphere research sites (2000-2011), Chair of the Global Terrestrial Observing System – Terrestrial Carbon Observations (GTOS-TCO), and I served on the National Research Council committees “Verifying Greenhouse Gas Emissions: Methods to Support International Climate Agreements,” and “Air Quality Management in the U.S.”

7. I have testified before U.S. House and Senate Committees on a variety of issues, such as "Managing forests in response to climate change including for natural resource adaptation and carbon sequestration," and "Monitoring, measurement, and verification of greenhouse gas emissions."

8. My curriculum vitae is attached as **Exhibit 1**.

9. I have reviewed the Proposed Amicus Curiae Brief and other submissions filed by James Johnston in this case. James Johnston is technically an Assistant Professor, Senior Research at Oregon State University. This means he is fixed-term non-tenure-track and brings in his own salary from grants and contracts, which I understand comes in part from grants and monies for work that he does for the United States Forest Service.

10. I make this declaration to rebut the claim made by James Johnston that "no meaningful controversy among scientists exists," regarding the historical and present conditions of the forests at issue in the Eastside Screens Amendment and the environmental effects of the Screens Amendment. **ECF 58**.

11. Although James Johnston and a handful of other scientists have signed a letter to the Court providing their opinions based on a selection of studies, I write to inform the court that Dr. Johnston's claim that there is a "scientific consensus" does not accurately reflect the state of the science generally on these topics, nor specifically the best available science and field verification of the condition of the forests at issue in this case.

12. There has been extensive scientific debate in publications regarding the historical and current state of the eastside forests. See for example, the debate between Hagmann et al. (2013) and Baker and Hanson (2017) discussing the use of different methodologies to

arrive at different conclusions regarding historical forest composition and fire severity published in peer-reviewed publications.

13. Indeed, James Johnston fails to point out in his letter that, during the public process for the Screens Amendment, I and over 150 other scientists submitted a letter to the Forest Service requesting that the 21" rule protecting large trees remain in effect. **See AR 49237**. In the letter conveyed our opposition and the controversy:

> The Forest Service is amending its forest plans on >9 million acres (3.6 million ha) in eastern Oregon to lift protections for large trees that have been in place for over two decades. The planned amendment threatens to set back forest recovery that has only recently followed a century of clear-felling and high-grade logging. Protections were put into place in 1994 targeting forests that needed time to recover depleted large-tree populations particularly for wildlife species that are highly dependent on that now scarce element in these Eastside forest. Although ***removing protections for large trees is highly controversial from a scientific perspective***, the Forest Service is rushing forward without adequately analyzing the impacts of the proposal on wildlife habitat, aquatic ecosystems, hydrological cycles and carbon values. (emphasis added)

14. I have first-hand knowledge of the administrative process for the Screens Amendment because I was an invited panelist at the Forest Service's Science Forum on May 11, 2020 (Available at: https://vimeo.com/727176378/bf53f1ea42, starting at 1:43:00). The purpose of that panel was to present scientific information. I delivered information on our peer-reviewed publications during my presentation that directly contradicts James Johnston's assertion that there is a "scientific consensus" on the issues presented in this case. That testimony includes but is not limited to the rarity of large trees in eastside forests and their significant contribution to forest carbon and biodiversity, which is a priority for protection nationally and internationally (Law et al. 2021, 2018, 2001, Hudiburg et al., 2013, Buotte et al. 2019, 2020). See AR 32289-32294, which is the powerpoint I delivered.

15. I also submitted testimony to the United States Forest Service on the proposed elimination of protections for trees 21 inches and greater, and I have attached that as **Exhibit 2** to this declaration. In that letter I relayed the findings of over 30 years of study on Eastside forests, and presented findings which directly contradict James Johnston's claims, namely:

- Forests with large trees and closed canopies create a microclimate that buffers climate extremes. ***Removal of the overstory creates canopy openings that increase solar radiation penetration to the forest floor, resulting in increased drying and heating of the understory and litter), which increases risk of fire ignitions and higher wildfire severity*** (Law et al. 2001, Burnett et al. 2019, Ma et al. 2010).

- Near-future vulnerability to fire is generally low on the eastside, with the exception of a few areas (Buotte et al. 2019). ***The large trees are less vulnerable to fire, and removing them will not reduce fire occurrence.*** Contrary to common belief, 40-60% of fire emissions are from litter and duff in all fire severities, and 0% of large conifer bole biomass combusts in all severities, and up to 5% of large tree branch biomass combusts, whereas smaller trees have much higher combustion in all burn severities (Campbell et al. 2007). For context, harvest-related emissions in Oregon are 10 times wildfire emissions (Hudiburg et al. 2019).

16. In his amicus letter and his recent article, Johnston suggested without evidence that protecting old-growth ponderosa pine and western larch from large grand fir *requires* cutting large diameter trees across the landscape (Johnston et al. 2021). According to my field research, he appears to have overestimated the co-occurrence of these species.

17. Our research team intensively analyzed measurements of 636,520 trees on 3,335 USFS inventory plots (~1 acre plots) to determine the percentage of large trees on the same eastern Oregon and Washington landscape that is governed by the screens and is the subject of this case. We quantified aboveground biomass carbon of those trees, and the co-occurrence of grand fir species with those trees. We found that large-diameter trees (≥

53 cm or 21 inches) account for just 3% of all stems, but hold 42% of total aboveground carbon (Mildrexler et al. 2020).

18. Contrary to James Johnston's assertions, we found that across all FIA plots in the region, large ponderosa pine and large grand fir are found together on only 8% of all plots; large larch and large grand fir are found on only 4% of all plots. Large ponderosa pine are the most common tree species (56% of plots) on all six national forests in the region and infrequently co-mingle with large grand fir (14% of the time) at the FIA plot scale. Large larch trees are far less common (7% of total plots) and co-mingle with large grand fir about half the time (56% of the time) (Mildrexler et al. in press).

19. Therefore, across the entire study area, only 8% of all plots have the large-tree co-occurrence of ponderosa pine and grand fir that the Forest Service says is the primary reason for weakening the 21-inch rule. Whether or not the Forest Service's determination that grand fir is encroaching on ponderosa pine to their detriment holds true, the fact that 92% of the forested landscape does not fit their rationale is a major finding, and is at the center of the scientific controversy.

20. Stated plainly, the Forest Service, and their consultant James Johnston, are making a mountain out of a molehill. We cannot know where wildfire will burn, yet they have eliminated protections for large trees based on a gross overstatement of the risk so that the Forest Service will be able to authorize the preemptive killing and removal of large grand fir trees across the entire landscape. James Johnston's theory is based on questionable assumptions and selective presentation of data that preemptive actions will protect large ponderosa pine trees.

21. To the further underscore the controversy, decades of research indicate that fire behavior

is heavily driven by weather and climate, not stand density (e.g., Abatzoglou et al. 2016, Bradley et al. 2016, Povak et al. 2020, among many others), and it has long been known that, in mild and moderate fire weather, one can conduct prescribed fire or managed wildfire to achieve lower-severity fire effects, if that is the goal.

22. All of that is not to say there are not some areas of agreement. In particular, Johnston states that there is "little or no meaningful debate or controversy in the scientific literature about the importance of large and old trees," and recognizes "significant variability in historical forest structure and composition." ECF 58 at 11. True, but such statements distract from the core issue.

23. The controversy lies in the Forest Service's decision to remove protections for large trees across eight million acres of national forestland, replacing it with an uncertain guideline—regardless of historical or current forest structure and composition, contrary to the findings and recommendations of many scientists, and at the expense of many other important values including carbon storage. When applied across this vast landscape, the justifications for and effects of blanket removal of large-tree protections are scientifically controversial.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed this 24th day of March, 2023 in Corvallis, Oregon

BE Law

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Dr. Beverly Law

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