Friends of the Clearwater
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June 26, 2020

Sent via mail and email: appeals-northern-regional-office@usda.gov

Attention: Objection Reviewing Officer
White Pine Project Objection
USDA Forest Service, Northern Region
26 Fort Missoula Road
Missoula, MT 59804

Re: White Pine Project Objection

Objection Reviewing Officer:

Pursuant to 36 CFR Part 218, Friends of the Clearwater (FOC) and Alliance for the Wild Rockies file this objection to the final environmental assessment and draft decision notice and finding of no significant impact for the White Pine project. This timber sale is proposed for the Palouse Ranger District of the Clearwater National Forest (a portion of the administratively combined Nez Perce-Clearwater National Forests). The responsible official is District Ranger Stefani Spencer.

Pursuant to Part 218, FOC is the lead objector. The contact person is Gary Macfarlane, FOC Ecosystem Defense Director, P.O. Box 9241, Moscow, Idaho 83843 (208-882-9755)

The draft decision notice's selected alternative is the proposed action as described in the environmental assessment. This project includes vegetation management of up to 1,707 acres of regeneration harvest, 276 acres of commercial thinning, and fuel activity treatments. Road construction includes up to fifteen miles of temporary roads and up to two miles of permanent roads, with undisclosed mileage for maintenance and reconstruction.

Please note we incorporate within this Objection the objection submitted by Harry Jagemon.

We also incorporate a trip report to the White Pine project area in 2020, along with a set of photographs, by Bryce Poplawsky. There are also photos from another trip in 2019.

We incorporate our comments on the NPCNF Draft Forest Plan/Draft EIS, because those comments discuss many of the same resource issues raised in this Objection.

The below objection statements are connected to prior specific written comments on White Pine or issues that arose after the opportunity for comment. Attachments, references, and other incorporated documents are included on the data DVD with the version sent to the Forest Service (FS) via US mail postmarked on this date.

Thank you for considering our objection points.

Sincerely submitted,

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And for:

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Friends of the Clearwater (FOC) and Alliance for the Wild Rockies (AWR) object to the White Pine project.

We have included with our earlier scoping comments and this objection what we believe is the best available science. For several issues below, the issue is controversial and an environmental impact statement (EIS) must be conducted. For all science upon which the Forest Service relies, we expect the agency to explain why it is relying on the science it does, and especially when that is inconsistent with the science that we have cited.

We request notice of all actions taken in relation to this project, pursuant to 40 C.F.R. § 1506.6. We would appreciate email in addition to mail. Please send all notices to the following emails: gary@friendsoftheclearwater.org; katie@friendsoftheclearwater.org; and jeff@friendsoftheclearwater.org.

We are very disappointed the Forest Service chose not to release a draft EA for public comment prior to this Objection process. This harms public participation because this objection period is the first chance that any of the public has had an opportunity to review the EA. Thus, we have raised the issues that have become apparent with the EA, as this is our first time seeing what information the Forest Service is using to come to its conclusions and how it is conducting analysis.

There are some new issues raised below because the Forest Service has changed the legal authority underlying the project from what it was during the scoping period. Under the scoping comment period, the Forest Service proposed this project under the Healthy Forest Restoration Act and the Farm Bill, codified at 16 U.S.C. §§ 6591a and 6591b. Under this statute, the authority for the project was very specific and so were the scope of the project and activities that were allowed. As this project is now under the broader authority of the National Environmental Policy Act (NEPA), there are new issues the Forest Service must consider and hard looks it must take. This project should really be re-scoped under NEPA to correct this drastic change in legal authority to allow the public the fullest opportunity to participate. In any event, all of these objection points must be considered. The Forest Service held a public meeting outside of the scoping process and welcomed feedback **at any time during the planning process**:

Second meeting for White Pine project to be held in Potlatch

The Nez Perce-Clearwater National Forests is hosting a public meeting for the White Pine project on Tuesday, Oct. 30 from 5 p.m. to 7 p.m. (PDT) at the Palouse Ranger District office in Potlatch (1700 Highway 6). The public is invited to attend the meeting to learn more about the White Pine project and provide feedback to the project team.

The White Pine project's 30–day scoping period began Sept. 28. While this meeting will take place after the end of the scoping period, the project team will accept feedback from the public at any time during the planning process. Those wishing to submit formal comments for the White Pine project are encouraged to do so before the end of the scoping period.

The White Pine project, located in the northwest portion of the Palouse Ranger District in Benewah and Latah counties, encompasses 7,000 acres of National Forest System lands and aims to improve species/age class diversity and forest health and reduce potential wildfire in the Wildland Urban Interface. The project is expected to be completed using authorities under the Healthy Forest Restoration Act as amended by the 2014 Farm Bill.

More information about the White Pine project is available at **www.fs.usda.gov/project/?project=54742**. If you have questions about the project, the upcoming public meeting, or how to submit formal comment during the project scoping period, please contact Johanna Kovarik at **jkovarik@fs.fed.us**.

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See FS web White Pine announcement 2019. Below is our feedback.

NEPA PROCEDURAL VIOLATIONS

Our October 29, 2018 comments stated, "Given the paucity of information and detail in the PA, these comments are brief." We also stated, "The PA seems hastily done. It lacks important information. …Further, more information would aid the public in commenting on the proposal." Since that time the FS shifted procedures, ditched the HFRA process yet it still did not issue an Environmental Assessment (EA) under a 30-day comment period. This is the first opportunity for the public to review something that is much more detailed that previous FS issuances on this project.

The Forest Service has largely committed itself to a course of action well before engaging the public. Without a proper 30-day comment period, there is no opportunity for the public to comment on a genuine direct, indirect, or cumulative effects analysis or to comment on the comparisons of alternatives, including potential alternatives. Nor was there an opportunity for the public to comment on the FS's analysis demonstrating consistency with all applicable Forest Plan direction. There was also no opportunity for the public to comment on what the FS has identified as the best available science influencing project actions.

NEPA mandates federal agencies to encourage and facilitate public involvement, use practical means to minimize any possible adverse effects actions that impact the environment, and demonstrating that the agency has made the necessary environmental analysis. *See, e.g.*, 40 C.F.R. 1500.2. NEPA requires federal agencies do this to the "fullest extent possible," unless agency operations prohibit an action or makes compliance impossible. *See, e.g.*, 40 C.F.R. 1500.6.

So the first time the FS released an environmental assessment (EA) for this project is for a Forest Service-deemed objection period (which the Forest Service also calls a "predecisional administrative review" process, *see* 36 C.F.R. part 218). NEPA does not allow the agency to abrogate the topics upon which the public may comment on a draft EA in the public's first look at that document. By limiting the public to comment on the limited information provided scoping, the Forest Service is undermining the intent and requirements of the National Environmental Policy Act. By skipping a comment period and going straight to an objection period, the Forest Service is constructively limiting comments that would otherwise assist the Forest Service from taking a hard look at its action or comment on whether the analysis, project specs, or both, are indeed complying with the forest plan. Skipping a full public comment on the EA and moving straight into an objection process is a violation of NEPA.

Under NEPA, the purpose of an environmental assessment is not to "rubber stamp" a project; it is to provide a preliminary analysis that will either help determine whether there would be environmental impacts that would warrant an environmental impact statement (and thus a starting analysis to proceed to that impact statement) or whether there would be no significant environmental impact. An environmental assessment serves to:

> (1) Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact;
> (2) Aid an agency's compliance with the Act when no environmental impact statement is necessary;
> (3) Facilitate preparation of a statement when one is necessary.

40 C.F.R. § 1508.9(a).

NEPA mandates the public get a full chance to comment on an environmental assessment—a full chance to comment means allowing everyone, even individuals who did not participate in the scoping comments, to raise any issue in response to the EA, including those that may not have been raised in scoping. The purpose of NEPA procedures is to ensure that "environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA." 40 C.F.R. § 1500.1(b). Public scrutiny cannot happen until better information is disclosed, presumably with the EA.

Objection periods are normally open to those who participated in scoping or the EA comment period. Because the public has gotten only one opportunity to comment—in scoping—and because the Forest Service has skipped a normal comment period and proceeded to the objection period, it has prejudiced public comment in two ways: 1) it has constructively frustrated new commenters who might have otherwise commented in that second comment period; and 2) it attempts to frustrate commenters from raising issues that might have otherwise assisted the agency in taking a hard look at its action, as it is required to do under NEPA.

Remedy:
1) Drop the project;
2) Choose the no-action alternative;
3) Release the EA with a regular comment period open to the entire public on all issues, to diligently notify through the avenues used, to take those comments and update the EA, and *then* release an EA with an objection period. Otherwise, begin anew and prepare an EIS.

OBJECTION ON EA'S FAILURE TO DISCUSS OR PRESENT EXISTING CONDITIONS

The White Pine Project fails to discuss current conditions for key parts of the project area ecosystem including, but not limited to, unroaded areas and fisheries. We stated in our scoping comments that the Forest Service should look at the unroaded areas remaining in this part of the Clearwater, and haven't seen any attempt at analysis until this objection period.

The EA is largely missing disclosures for existing conditions on many resources—there is no detail for existing conditions in the EA. Pursuant to the definition of "environmental assessment," 40 C.F.R. §1508.9 dictates a Federal agency (i.e. The Forest Service) is responsible to "(1) Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact." The evidence and analysis are incomplete without reference to existing conditions, making the finding of no significant impact invalid. Furthermore, it is important to provide this information to grasp the full significance of any impacts of the project especially cumulative impacts. As indicated by 40 CFR §1508.7

> *Cumulative impact* is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

It is impossible to judge any potential cumulative impacts of this project if there isn't an understanding of the present conditions, and to omit present conditions to the public frustrates the public's right to high-quality information under NEPA and any meaningful review.

For example, the EA doesn't discuss existing conditions for fisheries. The fisheries report, not the EA, shows the "existing conditions" from a 1997 report, and that preceded the 1990s White Pine Timber Sale implementation. Also, there has been no attempt at figuring out the unroaded lands, and the impacts to those should be evaluated similarly to how the Forest Service evaluates impacts to unroaded lands contiguous to roadless areas. *See* USDA 2010. There are no existing conditions on how many roads exist in this area, the density of these roads, or even the amount of unauthorized roads, which the Forest Service indicated it might use to avoid building official roads. Similarly, the EA doesn't discuss the existing condition of soils, which should include the unauthorized trails the Forest Service plans to use in lieu of building more roads. As discussed below, there is no existing condition for wildlife species such as the fisher, which is problematic due to trapping impacts and the uptick in logging projects even these past five years.

Courts will set aside agency decisions that do not have baseline data. Take, for example, *Northern Plains Res. Council v. Surface Transp. Bd.*, 668 F.3d 1067, 1083–85 (9th Cir. 2011). In Northern Plains Resource Council, the court set aside the agency's decision for not taking NEPA's "hard look" at the impacts of its action when it deferred gathering baseline data on fish and the sage grouse until after approval of the project and for mitigation efforts. "Without establishing the baseline conditions which exist…there is simply no way to determine what effect the proposed [action] will have on the environment and, consequently, no way to comply with NEPA." *Half Moon Bay Fisherman's Mktg. Ass'n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988). The Forest Service has either violated NEPA by not having existing baseline data or not disclosing it in the environmental assessment.

For the reasons above, this EA violates the National Environmental Policy Act.

Remedies:
1) Choose the no-action alternative[1]
2) Withdraw the project
3) Provide detailed reports of existing conditions for key issues within the proposed project area and proper discussion on how these conditions will contribute to cumulative impacts

PURPOSE AND NEED STATEMENT TOO NARROW AND NOT A REASONABLE RANGE OF ALTERNATIVES

The purpose and need statement is not in the spirit of the National Environmental Policy Act and there is not a reasonable range of alternatives. When the Forest Service scoped this the first time, the agency stated that it was planning this logging project to move forward under the Farm Bill and HFRA, which allows the agency to consider few (or no) alternatives. In scoping comments, FOC had asked for alternatives, including alternatives that don't log in RHCAs or old-growth and step-down old growth, and alternatives that don't build new roads. Now, during the objection period, the agency has informed the public it has reversed course and informed the public it is doing this project under the National Environmental Policy Act, which does require the agency to consider reasonable alternatives. Yet, there is still only one action alternative. And, the agency has drawn the purpose and need so narrowly that only one alternative will fit—the action alternative. Because the agency hasn't considered reasonable alternatives, it has violated NEPA.

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[1] We would support a decision based on EA to implement the proposed decommissioning of historic logging road prisms, temporary roads from past decisions, and other nonsystem roads, along with the upgrading or replacing nonfunctioning culverts, and scarifying and recontouring as necessary of existing skid trails and landings as an acceptable modification of the No Action Alternative.

Remedies:
1) Withdraw this project; or
2) Start the scoping process again letting all of the public (and not just objectors) participate with a purpose and need that can be satisfied by a reasonable range of alternatives.

ILLEGITIMATE PURPOSE AND NEED FOR PROJECT, AND PROJECT MAY SIGNIFICANTLY IMPACT THE WHITE PINE SCENIC DRIVE AND BYWAY

There are a few purposes and needs for this project that are scientifically questionable or questionable as to whether the agency could satisfy this purpose and need with the project as proposed. These were more adequately addressed in other objection sections, such as fire ecology, forest health, and roads. The EA elaborated on a new purpose and need in the EA, and this deserves special mention because it wasn't part of the reason for the purpose and need in the original scoping, particularly under the limited authority of the 2014 Farm Bill (16 U.S.C. §§6591a and 6591b). In the EA, the Forest Service has an entirely new purpose and need: "There is a need to restore western white pine adjacent to the White Pine Scenic Highway (Hwy 6)." This Forest Service continues on that the "White Pine Scenic Highway was designated in order to highlight the very scenic drive through a magnificent stand of western white pine." The White Pine Scenic Byway was designated in 2004, where the large old trees there now that aren't white pines were the same large old trees sixteen years ago. We have attached what the Idaho Scenic Byways Brochure boasts as features along the White Pine Scenic Byway:

> From Cataldo, the White Pine Scenic Byway passes through the lush forests of Idaho's timber country and the numerous lakes and marshlands of the lower Coeur d'Alene River to the town of St. Maries, the Hughes House Museum, and other attractions. The byway then crosses the picturesque St. Maries and St. Joe rivers, the latter of which is the highest navigable river in the world.
>
> The route continues on Idaho 6, meandering south through the town of Emida, and the St. Joe National Forests which boasts the largest stand of White Pine in the country. The byway winds through rolling hills of the Palouse region to the historic town of Potlatch, once site to the largest white pine lumber mill in the world.

Idaho Scenic Byways Brochure. We've also included an interpretive sign of this Scenic Drive:

See White Pine Scenic Byway_Historical Marker Database.pdf (pdf of website)
Although difficult to see, this sign has Number 7, Old Sampson Trail, which “leads to a stand of mature white pine” and calls White Pine Drive “**a 12-mile section of Idaho 6 bordered on both sides of the roadway with old-growth forest**.” We’ve provided several websites of the White Pine Scenic Drive, and they promote the scenery as a whole, not solely white pine trees. *See* Scenic USA.net_White Pine Scenic Byway; White Pine Scenic Route-Visit North Central Idaho website. The “Visit North Central Idaho” website has this picture for the White Pine Scenic Route:

This drive is promoted more for the scenic aspect than to specifically see white pine trees. What currently (and thankfully) missing from this drive are clearcuts.

Above: The picture from the Forest Service's own EA on White Pine Drive

Below is a picture of a clearcut from the Little Slate project:

People take scenic drives for the scenery, and the above picture resembles the visual impacts of what you are proposing to add to the White Pine Scenic Drive for the immediate and foreseeable future. **<u>This is a totally absurd purpose and need.</u>** It also significantly impacts a unique characteristic because clearcuts will be adjacent to this scenic drive and scenic byway. Most people don't take scenic drives to view clearcuts. Also, the Forest Service has no solid scientific evidence that white pines will actually regenerate here, given the warming climate and the white pine blister rust impacting the species, so this purpose and need is not supported with the best available science. We discuss the controversial science about the regeneration of tree species in the global warming part of this objection. There is scientific uncertainty that what the Forest Service is aiming for this project is possible and achievable by logging. This purpose and need is scientifically unsupported and is nonsensical.

Also, you haven't honestly disclosed what you plan to do in the purpose and need. In the purpose and need section, you discuss thinning for what borders Hwy 6. But the scoping and EA maps clearly show you have regeneration logging planned instead. The public needs more high-quality information.

For the reasons above, the Forest Service is violating NEPA.

Remedy
1) Withdraw the project;

2) Drop all logging units abutting the scenic highway, including the units that encompass old-growth and mature trees neighboring the highway. If trees need to be removed, select and remove them as each individual one pose a specific danger—don't eliminate the few hazard trees by removing an entire area that aren't hazard trees as part of a logging project.

FOREST PLAN DIRECTION AND DESIRED CONDITIONS (ILLEGITIMATE PURPOSE AND NEED)

In scoping comments on the proposed action, Friends of the Clearwater noted that the governing forest plan's desired future conditions were absent. The EA recites desired future conditions for 2037 recited in the forest plan, including "440 million board feet of harvest," "developing 509,000 acres of roadless land available for development," and "adding 2,750 miles of road to the forest road system" as the need for the proposal.

However, this was the desired future condition of the forest "if the management direction contained in the Forest Plan is implemented" and the description "assumes no change in Forest Plan direction for the next five decades." The management direction contained in the forest plan was not fully implemented—the Forest Service got sued on this forest plan precisely because the logging levels proposed were unsustainable. So the logging levels that lead to a settlement because they were so unsustainable—you are using those logging levels to justify this project? That is disingenuous need.

Also missing is any accounting of the roads that have been added to the Clearwater National Forest.

Remedies:
1) Withdraw the project.

CHANGING THE VEGETATION BASED ON A REVISED FOREST PLAN THAT HAS NOT UNDERGONE A COMPLETE ENVIRONMENTAL ANALYSIS AND DOES NOT HAVE A FINAL RECORD OF DECISION

FOC questioned the desired conditions and vegetation compositions in our scoping comments. We asked where this was specifically mentioned in the governing forest plan. This project lists a need to change the vegetation that is not in the current plan and has, of this date, only been proposed in a revised forest plan still undergoing an environmental review process.

The Forest Service states throughout this EA that the project will move the forest towards Warm Moist and Warm Dry PVT groups, and even lists this as a purpose and need. There is no such thing in the governing forest plan, and so this is an illegitimate purpose and need as well. As of the release of this EA, this has only been proposed in the revised forest plan and has not undergone the environmental review process—specifically, the agency has only started digesting the public's comments on this.

Using this theory, which you haven't vetted with science, suffers from the same problems as the revised forest plan, which reflect an overriding bias favoring vegetation manipulation and resource extraction via “management” to “move toward” a narrowly selected set of Desired Conditions. Along the way, it deemphasizes the ecological processes driving these ecosystems, so it ignores the best science. Essentially this rigs the game, since the revised forest plan’s desired conditions (which you shouldn’t be using at all in this EA) can only be achievable by resource-extraction activities. Since the Desired Conditions must be maintained through repeated management/manipulation, the management paradigm conflicts with natural processes**—**the evolutionary drivers of the ecosystem. This is evident by the habitat types identified by Cooper et al. 1991, which identify the climax vegetation when climate drives the ecological process and the Forest Service doesn’t set arbitrary static numbers.

Fire, insects & tree diseases are endemic to these forests and are natural processes resulting in a self-regulating forest. This provides for greater diversity of plant and animal habitat than management/manipulation can achieve. In areas that have been logged there is less diversity of native plants, more invasive species, and less animal diversity.

In any case, these processes also provide benefits. For example, cavity-nesting birds rely on insects in forests. Just as cavities excavated by woodpeckers provide benefits for other birds and wildlife, there are benefits from mistletoe, bark beetles, root rot fungi and other pathogens. The EA provides too little information about benefits of insects and tree diseases and even promotes a bias with its no-action alternative.

The draft revised forest plan claimed to “move toward” the natural range of variation (NRV) by focusing on achieving *static conditions*, instead of allowing the natural dynamic characteristics of ecosystems to provide ecosystem services. An abundance of scientific evidence indicates the draft forest plan’s static desired conditions, which you are unlawfully using here, should be replaced by *desired future dynamics* to align with best available science. Hessburg and Agee, 2003 emphasize the primacy of natural processes for management purposes:

> Ecosystem management planning must acknowledge **the central importance of natural processes and pattern–process interactions, the dynamic nature of ecological systems** (Attiwill, 1994), the inevitability of uncertainty and variability (Lertzman and Fall, 1998) and cumulative effects (Committee of Scientists, 1999; Dunne et al., 2001).

(Emphasis added.)

Sallabanks et al., 2001 state:

> Given the dynamic nature of ecological communities in Eastside (interior) forests and woodlands, particularly regarding potential effects of fire, **perhaps the very concept of defining “desired future conditions” for planning could be replaced with a concept of describing “desired future dynamics.”** (Emphasis added.)

McClelland (undated) criticizes the aim to achieve desired conditions, in that case retaining specific numbers of snags:

> The snags per acre approach is not a long-term answer because it **concentrates on the <u>products</u> of ecosystem processes rather than the processes themselves**. It does not address the most critical issue—long-term perpetuation of diverse forest habitats, a mosaic pattern which includes stands of old-growth larch. **The processes that produce suitable habitat must be retained or reinstated by managers. Snags are the result of these processes** (fire, insects, disease, flooding, lightning, etc.). (Emphases added.)

Castello et al. (1995) discuss some things that would be lost chasing static Desired Conditions:

> Pathogens help decompose and release elements sequestered within trees, facilitate succession, and maintain genetic, species and age diversity. Intensive control measures, such as thinning, salvage, selective logging, and buffer clearcuts around affected trees remove crucial structural features. Such activities also remove commercially valuable, disease-resistant trees, thereby contributing to reduced genetic vigor of populations.

Hayward, 1994 states:

> Despite increased interest in historical ecology, scientific understanding of the historic abundance and distribution of montane conifer forests in the western United States is not sufficient to indicate how current patterns compare to the past. In particular, knowledge of patterns in distribution and abundance of older age classes of these forests in not available. …Current efforts to put management impacts into a historic context seem to focus almost exclusively on what amounts to a snapshot of vegetation history—a documentation of forest conditions near the time when European settlers first began to impact forest structure. …The value of the historic information lies in the perspective it can provide on the potential variation… I do not believe that historical ecology, emphasizing static conditions in recent times, say 100 years ago, will provide the complete picture needed to place present conditions in a proper historic context. Conditions immediately prior to industrial development may have been extraordinary compared to the past 1,000 years or more. Using forest conditions in the 1800s as a baseline, then, could provide a false impression if the baseline is considered a goal to strove toward.

Noss, 2001, believes "If the thoughtfully identified critical components and **processes of an ecosystem are sustained**, there is a high probability that the ecosystem as a whole is sustained." (Emphasis added.) Noss 2001 describes basic ecosystem components (Emphasis added):

> Ecosystems have **three basic components: composition, structure, and function**. Together, they define biodiversity and ecological integrity and provide the foundation on which standards for a sustainable human relationship with the earth might be crafted.

Noss, 2001 goes on to define those basic components (Emphases added):

> **Composition** includes the kinds of species present in an ecosystem and their relative abundances, as well as the composition of plant associations, floras and faunas, and habitats at broader scales. We might describe the composition of a forest, from individual stands to watersheds and regions.
>
> **Structure** is the architecture of the forest, which includes the vertical layering and shape of vegetation and its horizontal patchiness at several scales, from within stands (e.g., treefall gaps) to landscape patterns at coarser scales. Structure also includes the presence and abundance of such distinct structural elements as snags (standing dead trees) and downed logs in various size and decay classes.
>
> **Function** refers to the **ecological processes** that characterize the ecosystem. These processes are both biotic and abiotic, and include decomposition, nutrient cycling, disturbance, succession, seed dispersal, herbivory, predation, parasitism, pollination, and many others. Evolutionary processes, including mutation, gene flow, and natural selection, are also in the functional category.

Hutto, 1995 also addresses natural processes, referring specifically to fire:

> Fire is such an important creator of the ecological variety in Rocky Mountain landscapes that the conservation of biological diversity [required by NFMA] is likely to be accomplished only through **the conservation of fire as a process**… Efforts to meet legal mandates to maintain biodiversity should, therefore, be directed toward **maintaining processes like fire**, which create the variety of vegetative cover types upon which the great variety of wildlife species depend. (Emphases added.)

Noss and Cooperrider (1994) state:

> **Considering process is fundamental to biodiversity conservation because process determines pattern**. Six interrelated categories of ecological processes that biologists and managers must understand in order to effectively conserve biodiversity are (1) energy flows, (2) nutrient cycles, (3) hydrologic cycles, (4) disturbance regimes, (5) equilibrium processes, and (6) feedback effects. (Emphasis added.)

The Environmental Protection Agency (1999) recognizes the primacy of natural processes:

> (E)cological processes such as natural disturbance, hydrology, nutrient cycling, biotic interactions, population dynamics, and evolution determine the species composition, habitat structure, and ecological health of every site and landscape. **Only through the conservation of ecological processes** will it be possible to (1) represent all native ecosystems within the landscape and (2) maintain complete, unfragmented environmental gradients among ecosystems. (Emphasis added.)

Frissell and Bayles (1996) state:

> …The concept of range of natural variability …suffers from its failure to provide defensible criteria about **which factors ranges should be measured**. Proponents of the concept assume that a finite set of variables can be used to define the range of ecosystem behaviors, when ecological science strongly indicates many diverse factors can control and limit biota and natural resource productivity, often in complex, interacting, surprising, and species-specific and time-variant ways. **Any simple index for measuring the range of variation will likely exclude some physical and biotic dimensions important for the maintenance of ecological integrity and native species diversity.** (Emphases added.)

Forest Service researcher Everett (1994) states:

> To prevent loss of future options we need to simultaneously **reestablish ecosystem processes and disturbance effects that create and maintain desired sustainable ecosystems**, while conserving genetic, species, community, and landscape diversity and long-term site productivity.
>
> …We must address **restoration of ecosystem processes and disturbance effects** that create sustainable forests before we can speak to the restoration of stressed sites; otherwise, we will forever treat the symptom and not the problem. … **One of the most significant management impacts on the sustainability of forest ecosystems has been the disruption of ecosystem processes** through actions such as fire suppression (Mutch and others 1993), dewatering of streams for irrigation (Wissmar and others 1993), **truncation of stand succession** by timber harvest (Walstad 1988), and maintaining numbers of desired wildlife species such as elk in excess of historical levels (Irwin and others 1993). Several ecosystem processes are in an altered state because we have interrupted the cycling of biomass through fire suppression or have created different cycling processes through resource extraction (timber harvest, grazing, fish harvest). (Emphases added.)

Further, Collins and Stephens (2007) suggest direction to implement <u>restoring the process</u> of fire by educating the public:

> (W)hat may be more important than restoring structure is restoring the process of fire (Stephenson 1999). By allowing fire to resume its natural role in limiting density and reducing surface fuels, competition for growing space would be reduced, along with potential severity in subsequent fires (Fule and Laughlin 2007). As a result, we contend that the forests in Illilouette and Sugarloaf are becoming more resistant to ecosystem perturbations (e.g. insects, disease, drought). This resistance could be important in allowing these forests to cope with projected changes in climate. … Although it is not ubiquitously applicable, (wildland fire use) could potentially be a cost-effective and ecologically sound tool for "treating" large areas of forested land. Decisions to continue fire suppression are politically safe in the short term, but ecologically detrimental over the long term. Each time the decision to suppress is made, the risk of a fire escaping and causing damage (social and economic) is essentially deferred to the

> future. Allowing more natural fires to burn under certain conditions will probably mitigate these risks. If the public is encouraged to; recognize this and to become more tolerant of the direct, near-term consequences (i.e. smoke production, limited access) managers will be able to more effectively use fire as a tool for restoring forests over the long term.

Biologist Payne, 1995 includes a commentary on the kind of hubris represented by the FS's view that it can manipulate and control its way to a restored forest by more intensive management:

One often hears that because humanity's impact has become so great, the rest of life on this planet now relies on us for its succession and that we are going to have to get used to managing natural systems in the future—the idea being that since we now threaten everything on earth we must take responsibility for holding the fate of everything in our hands. This bespeaks a form of unreality that takes my breath away… The cost of just finding out enough about the environment to become proper stewards of it—to say nothing of the costs of acting in such a way as to ameliorate serious problems we already understand, as well as problems about which we haven't a clue—is utterly prohibitive. And the fact that monitoring must proceed indefinitely means that on economic grounds alone the only possible way to proceed is to face the fact that by far the cheapest means of continuing life on earth as we know it is to **curb ourselves instead of trying to take on the proper management of the ecosystems we have so entirely disrupted.** (Emphasis added.)

In other places, the FS has recognized natural processes are vital for ecological integrity. USDA Forest Service, 2009a incorporates "ecological integrity" into its concept of "forest health" thus: "(E)cological integrity": Angermeier and Karr (1994), and Karr (1991) define this as:

> The capacity to support and maintain a balanced, integrated, and adaptive biological system having the full range of elements and processes expected in a region's natural habitat.
> "…the ability to support and maintain a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of the natural habitat of the region." That is, an ecosystem is said to have high integrity if its full complement of native species is present in normal distributions and abundances, and if **normal dynamic functions are in place and working properly**. In systems with integrity, the "…capacity for self-repair when perturbed is preserved, and minimal external support for management is needed." (Emphasis added.)

That last sentence provides a measure of resilience the DFP and DEIS don't acknowledge. In their conclusion, Hessburg and Agee, 2003 state "Desired future conditions will only be realized by planning for and creating the desired ecosystem dynamics represented by ranges of conditions, set initially in strategic locations with minimal risks to species and processes."

(Resiliency means different things to different resources at different scales. How does the forest define resilient and handle instances where "resilient" for one resource or wildlife species is not resilient for another? Old growth is a perfect example of this, as trees need to die and fall and decompose—while not great for timber production, this is necessary for wildlife like the fisher and the pileated woodpecker.)

Likewise Angermeier and Karr (1994) describe biological integrity as referring to "conditions under little or no influence from human actions; a biota with high integrity reflects natural evolutionary and biogeographic processes."

This EA, like the forest plan revision's draft EIS, considers no alternative that genuinely emphasizes this best tool—allowing the natural processes to maintain ecological integrity—for which we strongly advocate.

We've provided a lot of science that conflicts with the arbitrary goal of maintaining a set percentage from a plan that hasn't been approved. Where is your science that these trees made up the percentage that you claim? And why haven't you considered forest succession that does not utilize human intervention? *See* Cooper et al. 1991 for definitions of succession. Also, how are trees that are 70-120 years old inconsistent with dominance types on this forest, what is the conflicting scientific basis for that conclusion, and why are you adopting this uncited science over the overwhelming scientific consensus of allowing ecosystems to govern? We provide Cooper et al. 1991 for the science on this. On pages 137 to 143, the Forest Service scientists mapped habitat types and phases for stand sampled in North Idaho since 1980. The habitat types that Cooper et al. mapped are "named for the potential climax community type or plant association." Cooper et al. p. 5. The climax community is "[t]he culminating stage in plant (forest) succession for a given habitat..." The attributes of habitat type classification are useful because "they provide a permanent and ecologically based system of land stratification referenced to vegetation potential" and they even help with succession modeling.

When one looks at the habitat types in Latah County, these are what were mapped on Cooper et al. pp. 137-143 in the general White Pine Project Area. The key can be found on Cooper et al. p. 11.

THSE/GYDR: western hemlock/oak fern
THSE/ASCA (ASCA phase): western hemlock/wild ginger
TSHE/CLUN (CLUN & MEFE phase): western hemlock/queencup beadlily (beadlily and menziesia phases)
THPL/CLUN (CLUN phase): western redcedar/queencup beadlily (queencup beadlily phase)
ABLA/CLUN: subalpine fir/beadlily
ABGR/CLUN (CLUN phase): subalpine fir/beadlily (which seems pretty prominent in this area, according to the map)
ABGR/LIBO (LIBO phase): grand fir/twinflower.

The THSE series is the most shade tolerant series. "The undergrowth in this series is characterized by species with an affinity for the Pacific Maritime climatic regime." Cooper et al. p. 20. The ABLA series "occurs as a broad subalpine zone...." Cooper et al. p. 44. That is not to say these species should be expected: one misconception is that the abundance of climax vegetation is present on the landscape. Cooper et al states that a disturbance results in a "preponderance of seral stages." Cooper et al. p. 5. These classifications are associated with the climate—they are what will grow if undisturbed based on the climate of the area. If climate dictates what will grow there and disturbances will create variation in the makeup of species as it trends toward the climax, what support is there to prescribe arbitrary percentages of other trees? Where is your science on that, and why are is the science you have better than the extensive sampling done over a decade in Cooper et al. 1991 (which is a Forest Service publication)? The only thing these percentages support is the motivation to log to achieve this makeup.

You assert that historically, white pine is the most dominant on the Palouse Ranger District (EA p. 3), but provide the public no support for that. We are providing to you pictures from the Latah County Historical Society of Latah County, which is in the Palouse Ranger District.

White pine trees were mixed with other trees:

Pictured above, the men stand flanking a large white pine tree and there appear to be other large white pines. We also note the two large trees at left and right borders, and from the texture of the bark they appear to be western redcedar. While we can't tell what the men cut to get to the white pine pre-picture, the size of the cedars, which rival the size of the white pine, should indicate the niche that cedars occupy in this area. Yet you say that the project area is "outside of desired conditions” because of “85%” of the area has “shade tolerant species: grand fir/western red cedar (63%) and Douglas-fir (22%)...”

We also don’t think you are correct on Douglas-fir. The Forest Service implies Douglas-fir is undesirable by aiming for trees with other species dominance—has co-evolved with fire and is very adapted to it. *See* Tepley et al. 2013. And in this part of the country, stand-replacing fires are part of the regime. *See* Fire Ecology Section. The Forest Service is concluding--with little evidence--that landscape-level replanting will work. See Johnson 2016. Below are pictures of Latah County the early 20th Century, courtesy of the Latah County Historical Society. Dense forests existed even one hundred years ago.


The patch of trees above also has a lot of mid-seral species. Mid-seral species lead to old growth—it is part of the succession process. *See* Cooper et al. 1991. And the Clearwater in particular is short on old growth. (See our old-growth section.) So your claim of "over abundance" of mid-seral species makes no sense. If you want to increase old growth, these trees have to compete, and some will fall to the forest floor and die. You cannot log to create old growth—if that is what the agency is asserting it can do (as you have asserted that you will "enhance" old growth with logging) then we must insist on the science and monitoring that forms the factual basis to this conclusion and the purpose and need that this can "improve forest health." The science we have demonstrates the opposite: tree death, from fire, insects, and—yes—*disease* is what paves the way for biodiversity, multi-structural stands, and, ultimately, old growth. *See* Franklin 1987; USDA Pacific Northwest Research Station 2003, and our old-growth section of this objection. Additionally, the Forest Service's own previous wildlife reports for other logging projects acknowledge that simplifying forest structure degrades old growth.

The desired conditions you list in the purpose and need section of this EA also doesn't account for climate change. (See the Climate Change section). White pine blister rust is becoming more prevalent with global warming because the winters aren't cold enough to kill it anymore. What happens when your regeneration cuts, which remove all the trees in the area, eliminates the white pine that have survived thus far?

Also, former US Forest Service Chief Abigail Kimbell and Hutch Brown (in USDA Forest Service, 2017b):

> Even if global greenhouse gas buildups were reversed today, global temperatures would continue to rise for the next hundred years, bringing regional warming, changes in precipitation, weather extremes, severe drought, earlier snowmelt, rising sea levels, changes in water supplies, and other effects. As it is, global greenhouse emissions are still rising, exacerbating all of these long-term effects. The capacity of many plant and animal species to migrate or adapt will likely be exceeded. Ecosystem processes, water availability, species assemblages, and the structure of plant and animal communities and their interactions will change. **In many areas, it will no longer be possible to maintain vegetation within the historical range of variability. Land management approaches based on current or historical conditions will need to be adjusted.** (Emphasis added.)

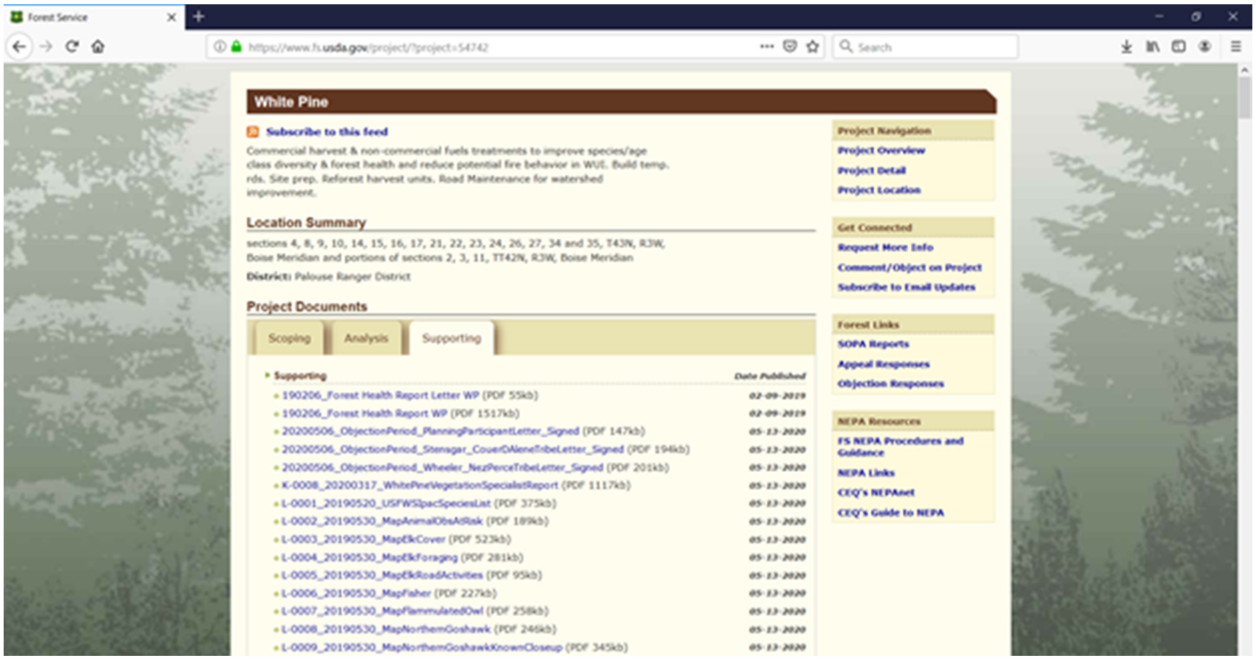
For the above reasons, this purpose and need is based on controversial science. The Forest Service hasn't taken a hard look at this science, has omitted it from any discussion or disclosure the public, and is not using high-quality information. As a result, the project would very unlikely achieve this stated purpose and need.

Remedy:
1) Withdraw the White Pine Project;
2) Prepare an environmental impact statement to address the scientific controversy and other issues presented in the above discussion.

<u>THE FOREST HEALTH STATED PURPOSE AND NEED IS ILLEGITIMATE BASED ON THE BEST SCIENCE</u>

When the scoping letter was issued, FOC commented that we could not find the forest health protection surveys conducted in July of 2018. We asked when they would be available and never received an answer by this Forest Service. We noted it was impossible to make specific comments on this topic.

As you can see from the web snapshot below (on 6/12/20), no reports on "forest health" were posted until well after the scoping period closed:



Here are the issues that we see with the forest health report:

1) The authors of the report didn't visit every unit, so how can this be a basis for logging or thinning in the units that weren't visited (especially when there is modeling information later in the same report that assesses a low risks of pathogens)? The authors visited about eight units, and this project has proposed logging for fifty-two units.

2) The authors note that the FIA/VMAP of root disease doesn't have precise spatial information, but just a "probability" of root disease, and recognized not all acres designated as high or moderate will even be affected. Three-quarters of the White Pine Project area has low risk for vulnerability to root disease. According to the report, is mostly planned for areas of "low" root disease hazard. If root disease is an actual ecological problem (which we contend it's not, see above and our fisher and old-growth sections for the necessity of dead trees in a healthy ecological forest system), how will logging the low areas satisfy this?

3) Neither this report, nor the EA, take into account (or even recognizes) the species that need dying trees or dead trees for habitat. For example, Region 6 recognizes that "Root diseases are responsible for large losses of **timber** in Pacific Northwest forests." USDA FS Region 6-Insects and Disease webpage. The webpage discusses management for "plantation establishment." Aiming to prevent timber losses under the guise of "forest health" is one-dimensional and only for timber. Yes, this is an E-1 area, but there are other forest-plan components that you are ignoring (specifically, wildlife) with a one-dimensional review.

4) The forest health survey focused on areas that it stated were commercial thinning, but the EA mapped some of these areas as for regeneration harvest. Did these change? Why?

5) The report recognizes that Armillaria root disease, "rapidly invades stumps and dying root systems created by harvest where it can persist as potent inoculum for up to 20 years, and retains

its viability in stumps for many more decades." For thinning, the report recognizes, "Thinning in stands of mostly grand fir and Douglas-fir can be expected to greatly increase the death of retained trees of these species within 20 years." The proposed thinning will actually kill the trees left.

6) The pathologists recognize that pathogens were not responsible for all tree death in the area.

7) Region 6 recognizes that Armillaria root disease is just about always presents in wetter habitat types. If this disease exists in this climate, and this project isn't changing climate, how is logging going to satisfy a purpose and need?

8) Region 6 recognizes that "[t]he probability of finding pathogenic Armillaria on the high productivity habitat types was higher on plots that had man-caused disturbance than on undisturbed plots" and that this pathogen can survive up to 35 years in old growth stumps. Why are you proposing logging if this pathogen will exist in stumps and can spread from stumps to healthy trees? *See* USDA Region 6 webpage.

In addition to forest health concerns that impact more than the bottom line, which we discuss at length in terms of how this project impacts more of the ecosystem than merely the timber the Forest Service wants removed.

We noted in our comments that the previous sale didn't "solve" the forest health problems. This is the second White Pine Timber Sale, the first of which was authorized in 1997. We provided you the full EIS from that timber sale in January, and are providing it again in our objection materials. One significant issue noted in the first White Pine sale (an EIS) was the decline of forest health "due to root diseases, mistletoe, heart rot, bark beetles, and white pine blister rust." White Pine EA Ch. II p. 5. The Forest Service failed to cite any science then, either. Yet, there is no discussion of this project in your EA or whether the logging to improve "forest health" worked. It would seem like you are proposing the same remedy for an action that didn't work in 1997 (an action that may never work because of the climate and ecosystems in this area), and you haven't answered our concerns at all. Given that root disease create the dead trees that forest ecosystems need, and fire is so infrequent, this might be a necessary disturbance, which means that using this as a "purpose and need" is bogus, and also there needs to be a better discussion of what happens when the Forest Service eliminates the processes that provide future snags for wildlife.

Given the issue of the purpose and need and the strategy to try to satisfy that issue, the Forest Service hasn't taken a hard look at the impacts of this project, including considering that dead trees are good for wildlife. The Forest Service also hasn't explored any reasonable alternative. Given that logging might actually exacerbate the problem addressed in this purpose and need, that is not likely to be a reasonable alternative according to your own criteria. If pathogens persistently exist in a certain climate, and the Palouse Ranger District is in that climate, trying to change the ecosystem is a fool's errand.

Remedies:
1) Withdraw the project;

2) Consider the trade off between some pathogens and the habitat it creates for wildlife
3) Look at non-logging alternatives if, after considering number 2 above, the Forest Service still concludes that pathogens are a problem

CUMULATIVE EFFECTS AND MONITORING

Our October 29, 2018 comments stated, "We also expect the Forest Service to review the monitoring requirements from the previous sale and include those in the environmental analysis for this project." Also, "You must analyze the cumulative impacts from all past projects (completed, ongoing, and proposed) in the vicinity of White Pine." And, "Please discuss the various developments that have taken place in and around the area, what has been accomplished, and all monitoring from the national forest timber sales, grazing allotments and other developments."

NEPA requires that high-quality information is available to the public and that NEPA documents concentrate on issues truly significant to the action in question. One highly significant issue is cumulative effects, including fostering understanding of how past actions may have led to the current conditions (good or bad), and therefore the next steps for management as laid out in the EA.

It is vital that the results of past monitoring be incorporated into project analysis and planning. This means including in the analysis:

- A list of all past projects (completed or ongoing) implemented in the analysis area.
- A list of the monitoring commitments made in all previous NEPA documents covering the analysis area.
- The results of all that monitoring.
- A description of any monitoring, specified in those past project NEPA for the analysis area, which has yet to be gathered and/or reported.
- A summary of all monitoring of resources and conditions relevant to the proposal or analysis area as a part of the Forest Plan monitoring and evaluation effort.
- A cumulative effects analysis which includes the results from the monitoring required by the Forest Plan.
- The regional impacts of projects that border each other

From the August 1997 White Pine Creek Timber Sale Record of Decision:

> Monitoring is designed to verify that projects are implemented as designed, and that mitigation measures are effective and efficient. Monitoring entails comparing the results being achieved to those predicted in the project environmental analysis and the Forest Plan. Project monitoring will be conducted as specified in the EIS (pages H-19 and II-23) and as required by the CFP (Chapter IV-G). A summary of monitoring activities follows.
>
> **a. Terrestrial Ecosystems**
>
> **Timber Sale Implementation**

Timber sale layout and marking will be reviewed by the interdisciplinary team (including the District Ranger) and individual specialists to confirm application of key design features and mitigation measures. This will also provide the feedback loop on planning assumptions and achieve adaptive management. These type of monitoring and consultation activities will also occur during logging and post-sale activities.

Timber sale activities will be monitored by the Engineering Representative during the road construction phase, and by the Timber Sale Administrator during the logging phase to make sure all contractual requirements are being met. Frequency of inspections will be commensurate with the level of sale activity. Documentation of this monitoring can be found in the inspection reports in the contract files at the District office.

Reforestation

Reforestation will be monitored thoroughly in the first, third, and fifth year after planting. If too many trees die after planting, the area will be replanted. Success in reforestation (i.e., full stocking of desired tree species) within five years of planting has been over 95 percent on the Palouse District.

Wildlife

The Zone Law Enforcement Officer, County Sheriff's Deputies, and district personnel will enforce and monitor the effectiveness of road and trail use restrictions.

Management Indicator Species are monitored at the forest level.

b. Aquatic Ecosystems

1) The White Pine Creek analysis area will be included in both the Clearwater National Forest BMP and INFISH monitoring programs. These programs will look at BMP implementation and effectiveness and RHCA adequacy.
2) Channel stability transects (Riffle Stability Index - RSI) were surveyed in both White Pine and Blakes Fork creeks prior to activities (1993 and 1996). These transects will be used to monitor effects and trends following harvest activities. Since channel morphology is of primary concern, this tool is useful as it assesses channel morphology (shape) as well as the particle size distribution of the stream bed (bedload and surface fines). These transects will be re-surveyed on a three year cycle for a minimum of three years beyond the life of the project.
3) Aquatic macroinvertebrates will continue to be monitored in White Pine Creek. Monitoring occurred in 1994, 1995, and 1996 and will continue for a minimum of 3 years beyond the life of the project.
4) Stream temperature will continue to be monitored in Meadow Creek (below Blakes Fork) as part of the districts baseline temperature monitoring program.
5) In 1995, 18 fisheries transects were permanently located in Meadow Creek to assess fisheries condition. One pool and one riffle transect were randomly selected to be monitored (rod and level profiles, pebble counts). These two transects will be monitored on the same schedule as the White Pine and Blakes Fork RSI's beginning in 1999.

> 6) All road/draw crossings will be monitored to insure that sediment is not delivered to live streams. Monitoring will take place in the first year following road construction and again in year two or three (depending upon the results of year one). If sediment has the potential to reach a live stream, slash or straw filtration will be added. This data will be added to the District's draw monitoring data base.
>
> **c. Human Needs**
>
> The Forest Landscape Architect will monitor portions of harvest activity to ascertain compliance with scenery management objectives.
>
> If ground disturbing activities uncover previously uninventoried heritage values (i.e, cultural resources or historic properties), they will be treated according to the provisions stipulated in the programmatic agreement between the Clearwater National Forest and the State Historic Preservation Office.

In its tendency to disregard and obscure the history of its own management, the FS apparently cannot lay its hands on a summary of the results of that monitoring—required by the 1997 ROD.

From our reading of the EA, the FS apparently has no idea how well past FS projects met the goals, objectives, desired conditions, etc. stated in their respective NEPA documents such as the White Pine Creek Timber Sale EIS, and how well the projects conformed to forest plan standards and guidelines. The White Pine EA did not include an analysis of how well the statements of Purpose and Need in those NEPA documents were served. Does the FS ever consider such information in proposing new management actions?

The 1997 White Pine ROD states:

> The primary purposes of vegetation treatments and associated actions are to improve forest health and to reestablish western white pine as a major component in the forest ecosystem. Regeneration and intermediate harvest activities are needed to enhance the structure, composition and resiliency of the forest cover within the landscape. Prescribed fire and mechanical treatments are needed to reduce excessive fuel loading. New roads are needed because additions to the transportation system are required to accomplish some of these actions, and to provide long-term access for future management activities.
>
> Overstocked stands are more susceptible to root pathogens, bark beetles, defoliators and dwarf mistletoe. Intermediate treatments are needed to improve forest health by harvesting in overstocked stressed stands, while maintaining desirable seral species such as western white pine, ponderosa pine, and western larch.

So, this begs the question: After the FS implemented that timber sale—what happened with "forest health"? This new EA doesn't directly address that issue, nor cite any results of agency monitoring that previous action, which encompasses the White Pine EA project area. Based on the latest EA and its purpose and need, there are two conclusions we can arrive at: 1) Forest Plan implementation has been a failure in terms of "forest health", or 2) It's all BS, just a slightly different concoction to justify the same heavy-handing manipulations and industrial logging, with no sincere expectation that anything is really being improved. Either way, the FS doesn't look good.

And there can be no proper cumulative effects analysis in a NEPA document tiered to a Forest Plan EIS, if the FS has failed to properly conduct the monitoring as directed by the Forest Plan.

Those items are a critical part of the NEPA analysis. Without this critical link the validity of many EA assumptions are baseless. Without analyzing the accuracy and validity of the assumptions used in previous NEPA processes one has no way to judge the accuracy and validity of this new proposal. The predictions and effects analyses made in previous NEPA processes also need to be disclosed and analyzed because if these were inaccurate, and the agency is making similar decisions, then the current process will also lead to failure. For instance, if for previous projects the FS said they were going to do a certain monitoring plan or implement a certain type of management and these were never effectively implemented or monitored, it is important for the public and the decision maker to know. If there have been problems with FS implementation or monitoring in the past, it is not logical to assume that implementation will now all of a sudden be appropriate. If prior logging, prescribed fire and other "forest health" or "fuel" treatments have not been monitored appropriately, then the stated rationale for the White Pine project are invalid.

If the FS has been monitoring as we suggest, it would have information about what is a baseline of tree disease and mortality in this area of the Clearwater National Forest—which is highly relevant given the White Pine EA Purpose and Need. Tree mortality is a natural process with varying levels over time and across space. *See* Franklin et al. 1987. If the agency had been monitoring as per the Forest Plan and to validate previous project assumptions and predictions, the agency would have data that informs the EA's claim that regeneration logging, which involves removing most trees whether healthy or not, makes the forest more "resilient" in any way.

The Forest Plan is in total accord with what we're arguing here. In Chapter V, it states:

> Project environmental analyses provide an essential source of information for Forest Plan monitoring. First, as project analyses are completed, new or emerging public issues or management concerns may be identified. Second, the management direction designed to facilitate achievement of the management area goals are validated by the project analyses. Third, the site-specific data collected for project environmental analyses serve as a check on the correctness of the land assignment. All of the information included in the project environmental analyses is used in the monitoring process to determine when changes should be made in the Forest Plan.

Old Forest Service NEPA documents support this as well; they set out project-specific monitoring, like those in the White Pine I project. Because there has been no monitoring, there is just no support for a lot of assumptions in this project. So the Forest Service has violated NEPA by failing to disclose high-quality information to the public, use the best science, and take a hard look at the impacts of its project. The Forest Service has also failed to follow the Clearwater Forest Plan in violation of NFMA.

Further, Forest Plan Chapter V states, "If funds are inadequate to properly monitor the Forest Plan goals, objectives, standards, and resulting environmental effects, an analysis will be made to develop a further course of action. This may include Forest Plan amendment or revision, or revising implementation schedules."

The failure to conduct the required Forest Plan implementation monitoring, evaluation and reporting, together with the failure to undertake the kind of hard look under NEPA at the project level, makes it impossible for the decisionmaker and public to grasp the cumulative impacts of this new timber sale. Clearly, the FS is operating in the dark, which is perhaps why it is so seductive for the agency to prepare and EA for this project to be able to proclaim "no significant impacts." The FS must stop pretending there's nothing to be discovered where it doesn't want to look, and get on with preparing an EIS.

Forest Plan Chapter V mandates, "The Forest Supervisor shall review the conditions on the land covered by the Plan at least every 5 years to determine whether conditions or demands of the public have changed significantly." Another aspect of planning leading to informed decisionmaking—ignored by the FS.

The EA fails to provide sufficient analysis of other projects in the project area or in proximity. By not disclosing high-quality information upfront, the agency violates NEPA. Overall, the EA downplays or ignores such cumulative impacts. Specialist reports also do not adequately address cumulative effects from those projects. Determining significance requires consideration of context—given there are contiguous projects in this area, the significance of this action must be analyzed within the long-term and short-term contexts of the area(s) impacted. Significance also addresses intensity, which includes whether the action, in combination with other actions, might have cumulatively significant effects.

Remedy:
1) Select the No Action alternative;
2) Drop the project;
3) Reanalyze the environmental assessment in a manner that addresses the issues above, or better yet prepare an EIS that addresses these issues.

TRAVEL MANAGEMENT

At page 4 of our October 29, 2018 comments we requested the FS not construct any new roads. The Transportation System Specialist Report states, "Proposed Action was expressly created based on collaboration efforts and feedback that we received from the public and other partners." Apparently the FS did not read our comments.

We incorporate our comments concerning roads on the Draft Revised Forest Plan, found on pp. 301-323, into this objection.

In a report prepared for the Environmental Protection Agency, Endicott, 2008 notes the "physical impacts of forest roads on streams, rivers, downstream water bodies and watershed integrity can be dramatic and have been well documented." According to Endicott, 2008, "forestry-related sediment is a leading source of water quality impairment to rivers and streams nationwide." Remarkably, EPA indicates that "up to 90% of the total sediment production from forestry operations" comes from logging roads and steam crossings.[2] A significant portion of this sediment is collected and discharged directly into rivers and streams through ditches, channels, and culverts. (Endicott, 2008.)

The EPA states, "[s]tormwater discharges from logging roads, especially improperly constructed or maintained roads, may introduce significant amounts of sediment and other pollutants into surface waters and, consequently, cause a variety of water quality impacts."[3]
Endicott, 2008 states:

> There is no question that stormwater pollution from industrial logging roads and forest roads is harming and has the potential to harm beneficial uses, including spawning and rearing habitat for salmon and steelhead and drinking water supplies. Important ecological, economic, and social consequences stem from the sediment discharged from ditches, channels, and culverts along forest roads. Ecologically, fine and coarse-grained sediment loading degrades water quality and detrimentally affects fish and other aquatic species' habitat. (Endicott, 2008.) Sedimentation affects streams by reducing pool depth, altering substrate composition, reducing interstitial space, and causing braiding of channels (Rieman and McIntyre 1993), which reduce carrying capacity. The effects of road construction and associated maintenance account for a majority of sediment loads to streams in forested areas;
>
> Sedimentation negatively affects bull trout embryo survival and juvenile bull trout rearing densities. (Shepard et al. 1984 at 6; Pratt 1992 at 6.) An assessment of the interior Columbia Basin ecosystem revealed that increasing road densities were associated with declines in four nonanadromous salmonid species (bull trout, Yellowstone cutthroat trout (*Oncorhyncus clarkii bouvieri*), westslope cutthroat trout (*O. c. lewisi*), and redband trout (*O. mykiss spp.*)) within the Columbia River basin, likely through a variety of factors associated with roads. Bull trout were less likely to use highly roaded basins for spawning and rearing and, if present in such areas, were likely to be at lower population levels. (Quigley and Arbelbide 1997 at 1183.) These activities can directly and immediately threaten the integrity of the essential physical or biological features necessary for bull trout survival.

Endicott, 2008 concluded:

> The physical impacts of roads have detrimental effects on fish and fish habitat. Mechanisms through which roads exert these deleterious impacts include fine

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[2] *Guidance Specifying Management Measures For Sources of Nonpoint Pollution in Coastal Waters,* EPA Guidance Paper 840-B-93-001c, at 27 (1993); *see also* Endicott 2008 at p. 9.
[3] 77 Fed. Reg. 30473 (May 23, 2012).

> sediment effects, changes in streamflow, changes in water temperature caused by loss of riparian cover or conversion of groundwater to surface water, and migration barriers. The physical impacts of roads discussed above have widespread and profound effect on fish habitat and fish communities in populations across a wide range of environments and conditions (Lee at al., 1997).

The White Pine EA does not demonstrate the FS is managing the project area and forest consistent with the Travel Management Regulations (36 CFR 212) Subpart A which requires the FS to involve the public while conducting a science-based analysis to identify the minimum road system needed to manage the Forest ecologically sustainably and within expected budgets. The Transportation Systems Report states, "The Nez Perce Clearwater National Forests Land and Resource Management Plan (LRMP) provides standards and guidelines for an Environmental Assessment." Apparently this specialist is familiar with a non-existent "LRMP" but not the Clearwater Forest Plan, and not the Travel Management Regulations (36 CFR 212) Subpart A, which is also not mentioned.

The White Pine EA outlines the proposal for roads:

> … approximately 2 miles of permanent road will be constructed along with up to 20 miles of maintenance and up to 8 miles of reconstruction on existing National Forest system roads. Temporary roads (approximately 15 miles) will be constructed to facilitate timber harvest and will be decommissioned after project activities, including site preparation and reforestation are completed.

The EA also states, "Historic logging road prisms used for timber harvest will be decommissioned after site preparation and planting…" The EA does not explain if there are other "historic logging road prisms" existing in the project area that will NOT be "used for timber harvest" and will therefore be left in, vaguely, "prism" conditions which to us means a potential chronic source of sediment and/or mass wasting. The Transportation Systems Report states, "The transportation systems specialist report **will only address the inventoried roads** within the project area." (Emphasis added.) The Fisheries Specialist Report, however, does admit, "Other legacy roads are likely present in the project area, but are not mapped, maintained, or proposed for obliteration."

The EA also identifies "User-created trails" which "may be used where possible for timber haul in order to reduce the need for additional road building. Post harvest these user created trails will be obliterated to discourage continued illegal use and to reduce potential sediment delivery into nearby streams." So the EA admits user created trail are likely degrading water quality, but the FS fails to address the full extent of the damage from user created trails: "Other user-created trails will be decommissioned **as funding allows**." (Emphasis added.). The EA fails to adequately disclose, in any quantitative or other meaningful terms, the extent of such illegal travel, the ongoing and cumulative damage to watersheds, and the cumulative impacts of such illegal trails on other forest resources such as soil, wildlife habitat, rare plants, etc.

The EA states that it will decommission temporary roads and skid trails from "past activities" as well as current actions. We have continually raised the issue with temporary roads in that they aren't temporary. If the last management in some of these areas was 2009, these temporary roads have existed for at least a decade, and probably more, and this means they probably weren't decommissioned as the FS committed to. How did this happen, and how are you going to ensure that it won't happen again?

The EA also describes the road reconstruction actions: "culvert replacements, spot rock replacements, brushing, and reshaping drainage dips will be implemented. Undersized culverts will be replaced." Again, without taking stock of such problems on ALL project area roads—not just those used for log hauling etc.—the EA fails to analyze and disclose ongoing and cumulative damage.

Lacking a proper travel analysis, there is no way for the public or decisionmaker to understand if the post-project road and trail network would be affordable and maintenance needs could be addressed by expected budgets or if the erosive forces of nature will manage these roads instead.

The EA does not disclose if adequate maintenance funding will exist for the post-project road network, and disclose how deferred maintenance costs might increase or decrease post-project.

The FS has performed no economic analysis that identifies sources of funds needed to maintain the road system. When the project mitigation stops in a year or two, the trajectory for fish habitat conditions will be downward. Beschta et al., 2004 state:

> (R)oad and landing construction is expensive and can siphon limited funds away from effective restoration measures, such as obliteration and maintenance. The backlog in maintenance of U.S Forest Service roads has been estimated to be several billion dollars (U.S. Department of Agriculture Forest Service 2000), and road construction inevitably adds to this seemingly insurmountable backlog. For these reasons**, the construction and reconstruction of roads and landings is not consistent with postfire ecosystem restoration.** (Emphasis added.)

Johnson (1995) states, "For the roads we no longer actively use, our dwindling road maintenance budget will make it difficult to maintain the culvert crossings. When these fail during storm and runoff events, tremendous amounts of sediment can be delivered directly to the channel and from there down to lower streams with significant beneficial uses such as sensitive fish habitat." The FS fails to analyze the significance of this foreseeable lack of maintenance in the project area—the direct, indirect and cumulative effects poorly maintained roads have on water quality.

The Transportation Systems Report admits, "Deferred maintenance is continually accruing, especially due to the reduced capacity to perform annual maintenance on Level 2 & 3 roads. Long intervals between project associated maintenance, has exacerbated the maintenance backlog."

The EA does not disclose the impacts of project area system roads not maintained in conformance to BMPs or in compliance with standards, because of funding shortfalls or other management inadequacies. The EA does not disclose the impacts of roads that go without maintenance because they are unauthorized or non-system. This is needed because "Recent reviews on project roads by the Nez Perce Tribe and Forest Service personnel have noted a number of potential impacts to watershed and streams as a result of deferred maintenance." (End of the World Project Proposed Action, February 2018.)

Beschta et al., 2004 explain that, whatever "temporary" means in this project's context, the newly disturbed sites have most of the hydrological and soil impacts of new road construction over the short- and long-term:

> Accelerated surface erosion from roads is typically greatest within the first years following construction, although in most situations sediment production remains elevated over the life of a road (Furniss et al. 1991; Ketcheson & Megahan 1996). Thus even "temporary" roads can have enduring effects on aquatic systems. Similarly, major reconstruction of unused roads can increase erosion for several years and potentially reverse reductions in sediment yields that occurred with disuse. (Potyondy et al. 1991). Where roads are unpaved or insufficiently surfaced with erosion-resistant aggregate, sediment production typically increases with increased vehicular usage (Reid & Dunne 1984).

Reid & Dunne, 1984 state:

> Runoff rates and sediment concentrations from 10 road segments subject to a variety of traffic levels were monitored to produce sediment rating curves and unit hydrographs for different use levels and types of surfaces. These relationships are combined with a continuous rainfall record to calculate mean annual sediment yields from road segments of each use level. A heavily used road segment in the field area contributes 130 times as much sediment as an abandoned road. A paved road segment, along which cut slopes and ditches are the only sources of sediment, yields less than 1% as much sediment as a heavily used road with a gravel surface.

Even several years after **obliteration**, conditions that affect erosion (e.g. infiltration & erodibility, vegetation cover) undergo nominal improvement (Foltz et al. 2007) and there's no indication that these conditions ever fully recover.

The EA does not incorporate the science-based transportation analysis required under 36 CFR § 212 Subpart A, and so there was no assessment that identified the unneeded roads. The EA also fails to discuss how the CNF's Travel Plan is being implemented here.

The FS regulations at 36 CFR § 212 Subpart A require the FS to identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of national forest lands. The NEPA process the FS used for White Pine project design is not consistent with the Travel Management Regulations at 36 CFR § 212 Subpart A.

On March 3, 2000, the FS set a course to revise 36 CFR Part 212 to shift emphasis from transportation development to managing administrative and public access within the capability of the lands. The proposal was to shift the focus of National Forest System road management from development and construction of new roads to maintaining and restoring needed roads and decommissioning unneeded roads within the context of restoring healthy ecosystems.

On January 12, 2001, the FS issued the final National Forest System Road Management Rule. The rule revised regulations concerning the management, use, and maintenance of the National Forest Transportation System. Consistent with changes in public demands and use of National Forest System resources and the need to better manage funds available for road construction, reconstruction, maintenance, and decommissioning, the final rule removed the emphasis on transportation development and **added a requirement for science-based transportation analysis**. The final rule is to help ensure that additions to the National Forest System road network are those deemed essential for resource management and use; that construction, reconstruction, and maintenance of roads minimize adverse environmental impacts; and that **unneeded roads are decommissioned** and restoration of ecological processes are initiated. (Emphases added.)

The White Pine EA does not incorporate the required science-based transportation analysis, and so there was no assessment that identifies all of the unneeded roads.

Our comments on the Draft Revised Forest Plan state:

> …the Nez-Clear National Forest has yet to identify, let alone achieve, a MRS that complies with Subpart A requirements. It is unclear if the Forest Service recognizes this fact, as it asserts, "*[i]n 2015, a forest-level roads analysis was completed for the Nez Perce-Clearwater. This analysis established a minimum road system for arterial, collector, and important local class National Forest roads on the Nez Perce-Clearwater.*"[4] Only NEPA-level decisions can identify the minimum road system, as the analysis may have acknowledged when it explained agency officials utilize the report as it works to identify the MRS.[5]…Further, we question the utility of the 2015 Travel Analysis Report as it recommended only 14 miles of road as "unneeded."[6] The Nez-Clear National Forest contains 7,682 miles of NFS road, and 14 miles represents just 0.18 percent of the total road system. It is beyond likely such a reduction could ever represent long-term funding expectations as required by Subpart A, or that such a small reduction would result in a road system that provides for the protection of NFS lands. A fact the Forest Service seems to recognize since it has decommissioned over 200 miles of road between 2015-2018.[7]As such, the Forest Service cannot rely on its 2015 TAR to adequately inform recommendations that will satisfy Subpart A requirements.

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[4] Draft Revised Forest Plan DEIS, p. 3.4.4-7.

[5] *Id.*, (stating, "The travel analysis report is used by the Nez Perce-Clearwater to prioritize maintenance needs and identify opportunities to decommission roads or put them into intermittent stored service as the Nez Perce-Clearwater works to identify the minimum number of routes needed for an efficient transportation system, as directed in 36 CFR § 212 subpart A.").

[6] *Id.*

[7] *Id.,* p. 3.4.4-10, Table 1. (The DEIS states incorrectly that Table 2 provides decommissioning numbers for the Nez Perce National Forest, but the table's title states "Miles of roads constructed from 1999 to 2018 on the Nez Perce National Forest.").

The NPCNF's identification of a paltry 14 miles of road as "unneeded" stands in stark contrast to the red/green map FOC obtained under FOIA concerning just the Nez Perce portion of the NPCNF, from the year 2000.

Nonsystem roads are not on any Forest inventory, and are not addressed by the annual road maintenance budget.

Forestwide, roads are not being maintained as needed. In the CNF's January 7, 2003 Roads Analysis Report it states:

> **Key Findings: Road maintenance funding is not adequate to maintain and sign roads to standard.**
>
> This road analysis clearly shows that annual appropriated maintenance funding is inadequate to maintain the current road system on the Forest. Many roads will continue to build up additional deferred maintenance costs and degrade unless increases in road management funding become available.

Also, "Road maintenance funding is not adequate to maintain and sign roads to standard. …Congressionally appropriated road maintenance funding is approximately 22% of what is needed for the current classified road system." (*Id.*)

Also, "Congressionally appropriated road maintenance funding is approximately 9% of what is needed for the current classified road system." (Nez Perce National Forest Roads Analysis Report, 2006.) That report also admits:

> Some arterial, collector and local roads are not being maintained to specified standards. In some areas the road system will continue to degrade and this will affect future access to areas served by these roads.

In failing to analyze the implications of insufficient funding for the project area, the EA violates NEPA.

FOC's August 27, 2014 Travel Analysis letter to the Forest Supervisor cited scientific information including Wisdom, et al. (2000):

> Our analysis also indicated **that >70 percent of the 91 species are affected negatively by one or more factors associated with roads.** Moreover, maps of the abundance of source habitats in relation to classes of road density suggested that road-associated factors hypothetically may reduce the potential to support persistent populations of terrestrial carnivores in many subbasins. Management implications of our summarized road effects include the potential to mitigate a diverse set of negative factors associated with roads. **Comprehensive mitigation of road-associated factors would require a substantial reduction in the density of existing roads as well as effective control of road access in relation to management of livestock, timber, recreation, hunting, trapping, mineral development, and other human activities.**

> **...Efforts to restore habitats without simultaneous efforts to reduce road density and control human disturbances will curtail the effectiveness of habitat restoration, or even contribute to its failure; this is because of the large number of species that are simultaneously affected by decline in habitat as well as by road-associated factors.**

(Emphases added.) Friends of the Clearwater's August 27, 2014 Travel Analysis letter is incorporated within this Objection.

36 CFR § 212 Subpart A directs each national forest to conduct "a science-based roads analysis," generally referred to as the "travel analysis process." The FS Washington Office, through a series of directive memoranda, instructed forests to use the Subpart A process to "maintain an appropriately sized and environmentally sustainable road system that is responsive to ecological, economic, and social concerns." These memoranda also outline core elements that must be included in each Travel Analysis Report.

The Washington Office memorandum dated March 29, 2012 (USDA Forest Service, 2012d) directed the following:

- A TAP must analyze all roads (maintenance levels 1 through 5);
- The Travel Analysis Report must include a map displaying roads that will inform the Minimum Road System pursuant to 36 C.F.R. § 212.5(b), and an explanation of the underlying analysis;
- The TAP and Watershed Condition Framework process should inform one another so that they can be integrated and updated with new information or where conditions change.

The December 17, 2013 Washington Office memorandum (USDA Forest Service, 2013b) clarifies that by the September 30, 2015 deadline each forest must:

- Produce a Travel Analysis Report summarizing the travel analysis;
- Produce a list of roads *likely not needed for future use*; and
- Synthesize the results in a map displaying roads that are *likely needed* and *likely not needed in the future* that conforms to the provided template.

The Subpart A analysis is intended to account for benefits and risks of each road, and especially to account for affordability. The TAP must account for the cost of maintaining roads to standard, including costs required to comply with Best Management Practices related to road maintenance.

The Travel Management Regulations at 36 CFR § 212.5 state:

> (b) Road system—(1) *Identification of road system.* For each national forest, national grassland, experimental forest, and any other units of the National Forest System (§ 212.1), the responsible official must identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands. In determining the minimum road system, the responsible official must incorporate a science-based roads analysis at the appropriate scale and, to the degree practicable, involve a broad spectrum of interested and affected citizens, other state and federal agencies, and

> tribal governments. The minimum system is the road system determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan (36 CFR part 219), to meet applicable statutory and regulatory requirements, to reflect long-term funding expectations, to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance.

The huge estimated annual maintenance costs for roads on the NPCNF far exceed all published estimates of road maintenance funding the Forest has received annually for decades. And although the FS never likes to conduct an analysis of or disclose the forest-wide ecological impacts of its road maintenance funding shortfalls, projecting from discussion in Gucinski et al. 2001 helps to start imagining the scale of the impacts.

It is also important to recognize the ongoing ecological damage of roads—regardless of the adequacy of maintenance funding. Undesirable consequences include adverse effects on hydrology and geomorphic features (such as debris slides and sedimentation), habitat fragmentation, predation, road kill, invasion by exotic species, dispersal of pathogens, degraded water quality and chemical contamination, degraded aquatic habitat, use conflicts, destructive human actions (for example, trash dumping, illegal hunting, fires), lost solitude, depressed local economies, loss of soil productivity, and decline in biodiversity. (Gucinski et al., 2001)

Huge bibliographies of scientific information indicate the highly significant nature of departures from historic conditions that are the impacts on forest ecosystems caused by motorized travel routes and infrastructure. From the Wisdom et al. (2000) Abstract:

> Our assessment was designed to provide technical support for the ICBEMP and was done in five steps. … Third, we summarized the effects of roads and road-associated factors on populations and habitats for each of the 91 species and described the results in relation to **broad-scale patterns of road density.** Fourth, we mapped classes of the current abundance of source habitats for four species of terrestrial carnivores in relation to **classes of road density** across the 164 subbasins and used the maps to identify areas having high potential to support persistent populations. And fifth, we used our results, along with results from other studies, to describe broad-scale implications for managing habitats deemed to have undergone long-term decline and for managing species negatively affected by **roads or road-associated factors**. (Emphases added.)

Carnefix and Frissell, 2009 make a very strong scientific rationale for including ecologically-based road density standards:

> Roads have well-documented, significant and widespread ecological impacts across multiple scales, often far beyond the area of the road "footprint". Such impacts often create large and extensive departures from the natural conditions to which organisms are adapted, which increase with the extent and/or density of the road network. Road density is a useful metric or indicator of human impact at all scales broader than a single local site because it integrates impacts of human disturbance

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

(Emphases added.) Wisdom et al., 2000, also state in their Abstract:

Our analysis also indicated **that >70 percent of the 91 species are affected negatively by one or more factors associated with roads.** Moreover, maps of the abundance of source habitats in relation to classes of road density suggested that road-associated factors hypothetically may reduce the potential to support persistent populations of terrestrial carnivores in many subbasins. Management implications of our summarized road effects include the potential to mitigate a diverse set of negative factors associated with roads. **Comprehensive mitigation of road-associated factors would require a substantial reduction in the density of existing roads as well as effective control of road access in relation to management of livestock, timber, recreation, hunting, trapping, mineral development, and other human activities.** (Emphases added.)

Frissell, 2014 states:

Roads are ecologically problematic in any environment because they affect biota, water quality, and a suite of biophysical processes through many physical, chemical, and biological pathways (Trombulak and Frissell 2000, Jones et al. 2000). The inherent contribution of forest roads to nonpoint source pollution (in particular sediment but also nutrients) to streams, coupled with the extensive occurrence of forest roads directly adjacent to streams through large portions of the range of bull trout in the coterminous US, adversely affects water quality in streams to a degree that is directly harmful to bull trout and their prey. This impairment occurs on a widespread and sustained basis; runoff from roads may be episodic and associated with annual high rainfall or snowmelt events, but once delivered to streams, sediment and associated pollutant deposited on the streambed causes sustained impairment of habitat for salmon and other sensitive aquatic and amphibian species.

> Current road design, management of road use and conditions, the locations of roads relative to slopes and water bodies, and the overall density of roads throughout most of the Pacific Northwest all contribute materially to this impairment. This effect is apart from, but contributes additively in effect to the point source pollution associated with road runoff that is entrained by culverts or ditches before being discharged to natural waters.

The EA fails to disclose the impacts of project area system roads not maintained in conformance to BMP or in compliance with standards because of funding shortfalls, and fails to disclose the impacts of roads that go without maintenance because they are unauthorized or non-system.

The FS must establish road management objectives for all project area roads.

The FS must not assume the project will adequately mitigate the problems chronically posed by the road network by project road work and BMP implementation. The FS admits such problems in a non-NEPA context (USDA Forest Service, 2010t):

> Constructing and improving drainage structures on Forest roads is an ongoing effort to reduce road-related stream sediment delivery. Although BMPs are proven practices that reduce the effects of roads to the watershed, it is not a static condition. Maintaining BMP standards for roads requires ongoing maintenance. Ecological processes, traffic and other factors can degrade features such as ditches, culverts, and surface water deflectors. Continual monitoring and maintenance on open roads reduces risks of sediment delivery to important water resources.

Also in a non-NEPA context, a forest supervisor (Lolo National Forest, 1999) frankly admits that projects are a “chance to at least correct some (BMP) departures rather than wait until the funding stars align that would allow us to correct all the departures at once.”

The FS relies heavily upon BMPs to address the issues associated with logging roads, but only implemented within the context of a project such as White Pine. The EA states, “Haul routes would be maintained to BMP standards, including proper drainage, adequate stream culvert capacity, and cleared and functional cross-drains.” However, comprehensive monitoring of the effectiveness of logging road BMPs in achieving water quality standards does not demonstrate the BMPs are protecting water quality, nor does it undermine the abundant evidence that stormwater infrastructure along logging roads continues to deposit large quantities of sediment into rivers and streams (Endicott, 2008). Even as new information becomes available about BMP effectiveness, many states do not update their logging road BMPs, and some states have retained BMPs that have been discredited for some time, such as using fords when they are known to have greater water quality impacts than other types of stream crossings. (Id.) If the measure of success is whether a nonpoint source control program has achieved compliance with state water quality standards, the state forest practices programs have failed.

Again, these programs are only triggered when active logging operations occur. The lack of a requirement in most states to bring existing, inactive logging roads and other forest roads up to some consistent standard results in many forest roads that are not currently being used for logging falling through the regulatory cracks and continuing to have a negative impact on our water quality. Currently, only the State of Washington requires that old roads be upgraded to comply with today's standard BMPs. Across most of the country, the oldest, most harmful logging roads have been grandfathered and continue to deliver sediment into streams and rivers. (Id.)

The FS may find out later that significant erosion, sediment, or other resource damage problems exist on roads not needed for log hauling, but the White Pine EA makes no commitments to bring all the roads up to BMP standards or otherwise fix the damage. The EA fails to consider the resulting impacts on water quality and fish habitat.

BMPs are "largely procedural, describing the steps to be taken in determining how a site will be managed," but they lack "practical in-stream criteria for regulation of sedimentation from forestry activities." (Id.) The selection and implementation of BMPs are often "defined as what is practicable in view of 'technological, economic, and institutional consideration." (Id.) The ultimate effectiveness of the BMPs are therefore impacted by the individual land manager's "value system" and the perceived benefit of protecting the resource values as opposed to the costs of operations. (Id.)

Ziemer and Lisle (1993) note a lack of reliable data showing that BMPs are cumulatively effective in protecting aquatic resources from damage. Espinosa et al., 1997 noted that the mere reliance on BMPs in lieu of limiting or avoiding activities that cause aquatic damages serves to increase aquatic damage. Even activities implemented with somewhat effective BMPs still often contribute negative cumulative effects (Ziemer et al. 1991b, Rhodes et al. 1994, Espinosa et al. 1997, Beschta et al. 2004).

In analyses of case histories of resource degradation by typical land management (logging, grazing, mining, roads) several researchers have concluded that BMPs actually increase watershed and stream damage because they encourage heavy levels of resource extraction under the false premise that resources can be protected by BMPs (Stanford and Ward, 1993; Rhodes et al., 1994; Espinosa et al., 1997).

The extreme contrast between streams in roaded areas vs. unroaded areas found on the adjacent Lolo NF (Riggers, et al. 1998) is a testament to the failures of the agency's BMP approach.

We cannot discern the intensity or thoroughness of surveys for inventorying sediment sources in the project area. Fly et al., 2011 describes a thorough survey in the Boise National Forest.

Roads influence many processes that affect aquatic ecosystems and fish: human behavior (poaching, debris removal, efficiency of access for logging, mining, or grazing, illegal species introductions), sediment delivery, and flow alterations. We incorporate The Wilderness Society (2014) which discusses some of the best available science on the ecological impacts of roads. We also incorporate the March 2020 WildEarth Guardians report, "The Environmental Consequences of Forest Roads and Achieving a Sustainable Road System."

When considering how effective BMPs are at controlling non-point pollution on roads, both the rate of implementation of the practice, and the effectiveness of the practice should both be considered. The FS tracks the rate of implementation and the relative effectiveness of BMPs from in-house audits. This information is summarized in the National BMP Monitoring Summary Report with the most recent data being the fiscal years 2013-2014 (Carlson et al. 2015). The rating categories for implementation are “fully implemented,” “mostly implemented,” “marginally implemented,” “not implemented,” and “no BMPs.” “No BMPs” represents a failure to consider BMPs in the planning process. More than a hundred evaluation on roads were conducted in FY2014. Of these evaluations, only about one third of the road BMPs were found to be “fully implemented” (Id., p. 12).

The monitoring audit also rated the relative effectiveness of the BMP. The rating categories for effectiveness are “effective,” “mostly effective,” “marginally effective,” and “not effective.” “Effective” indicates no adverse impacts to water from project or activities were evident. When treated roads were evaluated for effectiveness, almost half of the road BMPs were scored as either “marginally effective” or “not effective” (Id, p. 13).

A recent technical report by the FS (Edwards et al., 2016) summarizes research and monitoring on the effectiveness of different BMP treatments. Researchers found that while several studies have found some road BMPs are effective at reducing delivery of sediment to streams, the degree of each treatment has not been rigorously evaluated. Few road BMPS have been evaluated under a variety of conditions, and much more research is needed to determine the site-specific suitability of different BMPs (Id.; also see Anderson et al., 2012).

Edwards et al., 2016 cites several reasons for why BMPs may not be as effective as commonly represented. Most watershed-scale studies are short-term and do not account for variation over time, sediment measurements taken at the mouth of a watershed do not account for in-channel sediment storage and lag times, and it is impossible to measure the impact of individual BMPs when taken at the watershed scale. When individual BMPs are examined there is rarely broad-scale testing in different geologic, topographic, physiological, and climatic conditions. Finally, in some instances, a single study is used to justify the use of a BMP across multiple states without adequate testing.

Climate change will further put into question the effectiveness of many road BMPs (Edwards et al., 2016). While the impacts of climate will vary from region to region (Furniss et al. 2010), more extreme weather is expected across the country which will increase the frequency of flooding, soil erosion, stream channel erosion, and variability of streamflow (Id). BMPs designed to limit erosion and stream sediment for current weather conditions may not be effective in the future. Edwards et al., 2016 state, “More-intense events, more frequent events, and longer duration events that accompany climate change may demonstrate that BMPs perform even more poorly in these situations. Research is urgently needed to identify BMP weaknesses under extreme events so that refinements, modifications, and development of BMPs do not lag behind the need.”

Climate change is also expected to lead to more extreme weather events, resulting in increased flood severity, more frequent landslides, altered hydrographs, and changes in erosion and sedimentation rates and delivery processes. (Halofsky et al., 2011.) Many National Forest roads are poorly located and designed to be temporarily on the landscape, making them particularly vulnerable to these climate alterations. (Id.) Even those designed for storms and water flows typical of past decades may fail under future weather scenarios, further exacerbating adverse ecological impacts, public safety concerns, and maintenance needs. (Strauch et al., 2015.) At bottom, climate change predictions affect all aspects of road management, including planning and prioritization, operations and maintenance, and design. (Halofsky et al., 2011.)

The FS fails to analyze in detail the impact of climate change on forest roads and forest resources. It should start with a vulnerability assessment, to determine the analysis area's exposure and sensitive to climate change, as well as its adaptive capacity. For example, the agency should consider the risk of increased disturbance due to climate change when analyzing this proposal. It should include existing and reasonably foreseeable climate change impacts as part of the affected environment, assess them as part of the agency's hard look at impacts, and integrate them into each of the alternatives, including the no action alternative. The agency should also consider the cumulative impacts likely to result from the proposal, proposed road activities, and climate change. In planning for climate change impacts and the proposed road activities, the FS should consider: (1) protecting large, intact, natural landscapes and ecological processes; (2) identifying and protecting climate refugia that will provide for climate adaptation; and (3) maintaining and establishing ecological connectivity. (Schmitz and Trainor, 2014.)

The White Pine EA does not disclose the Project Area Road Management Objectives, which are to be developed consistent with the Travel Management Regulations.

When designating off-road vehicle trails and areas, federal agencies are required to minimize damage to forest resources, disruption of wildlife, and user conflicts. Exec. Order No. 11,644 § 3(a), 37 Fed. Reg. 2877 (Feb. 8, 1972), *as amended by* Exec. Order No. 11,989, 42 Fed. Reg. 26,959 (May 24, 1977). The FS must locate designated trails and areas in order to minimize the following criteria: (1) damage to soil, watershed, vegetation, and other public lands resources; (2) harassment of wildlife or significant disruption of wildlife habitat; and (3) conflicts between off-road vehicle use and other existing or proposed recreational uses. 36 C.F.R. § 212.55(b)(1)-(3).

The White Pine EA does not demonstrate that the FS has implemented or applied the minimization criteria in the route designation process, consistent with the objective of minimizing impacts. The EA does not adequately reflect how the FS applied the minimization criteria in its motorized trail and area designations, and the agency's draft DN is arbitrary and capricious and violates the Administrative Procedure Act (APA), NEPA, the National Forest Management Act (NFMA), the Travel Management Rule and the ORV Executive Orders.

Log hauling itself adds sediment to streams. From an investigation of the Bitterroot Burned Area Recovery Project, hydrologist Rhodes (2002) notes, "On all haul roads evaluated, haul traffic has created copious amounts of mobile, non-cohesive sediment on the road surfaces that will elevate erosion and consequent sedimentation, during rain and snowmelt events." USDA Forest Service, 2001a also presents an analysis of increased sedimentation because of log hauling, reporting

"Increased traffic over these roads would be expected to increase sediment delivery from a predicted 6.30 tons per year to 7.96 tons per year."

USDA Forest Service, 2016b (your Johnson Bar Draft EIS) states, "Increased heavy-truck traffic related to log hauling can increase rutting and displacement of road-bed material, creating conditions conducive to higher sediment delivery rates (Reid and Dunne, 1984)." The abstract from Reid and Dunne, 1984 states:

> Erosion on roads is an important source of fine-grained sediment in streams draining logged basins of the Pacific Northwest. Runoff rates and sediment concentrations from 10 road segments subject to a variety of traffic levels were monitored to produce sediment rating curves and unit hydrographs for different use levels and types of surfaces. These relationships are combined with a continuous rainfall record to calculate mean annual sediment yields from road segments of each use level. A heavily used road segment in the field area contributes 130 times as much sediment as an abandoned road. A paved road segment, along which cut slopes and ditches are the only sources of sediment, yields less than 1% as much sediment as a heavily used road with a gravel surface.

The 1998 Bull Trout Biological Opinion (BO) indicates that bull trout are absent when road densities exceed 1.71 mi./mi^2., depressed when the road density = 1.36 mi/mi^2 and strong when road density equals or is less than .45 mi/mi^2. (P. 67.)

U.S. Fish and Wildlife Service, 2015 states:

> Culverts that remain in the road behind gates and berms that are not properly sized, positioned, and inspected …have an increased risk for failure by reducing awareness of potential maintenance needs. The accumulation of debris has the potential to obstruct culverts and other road drainage structures. Without maintenance and periodic cleaning, these structures can fail, resulting in sediment production from the road surface, ditch, and fill slopes. The design criteria to address drainage structures left behind gates and berms require annual monitoring of these structures.

Members of the ID Team for the Clear Creek Project fully expressed concerns in project files for that project. From 110606TransportationNFMAQuestions.docx[8]:

> 2. What is broke or at risk?
> The existing size of the transportation system is in excess of what is needed for current uses of the National Forest land. Newer technologies require a less invasive road system structure. A history of skid road or jammer road use, and not properly stabilizing roads has lead to a higher risk of failure by landslides and culvert washouts. These risks are even higher in landslide prone landscapes.

[8] This document, from the Clear Creek project record, is included in our electronic documents, document title unchanged.

Another concern with the large transportation system is that it is cost prohibitive to maintain. The Forest cannot currently maintain all of the transportation system. Currently higher priority roads are being maintained to minimal standards, while other roads are not being maintained and have deferred maintenance. Roads with reduced maintenance or no maintenance are at a higher risk of failures and road closures.

More than 50 percent of the Nez Perce National Forest roads were built between 1960 and 1979. Road standards used during construction of these roads employed current BMPs. The life span of BMPs range anywhere from 10 to 50 years with repeated maintenance, so it is likely that many BMPs installed during original construction are at the end of their life span. BMPs productivity and life spans are reduced if maintenance has not occurred. Roads with BMPs near or at the end of their life span have a higher risk of failure.

4. How do you fix it?
Analyze all the system and non-system roads in the area and determine a minimum road system required based on needs and risks. Maintain roads needed for public and administrative use. Prioritize the repair of the needed roads based on risk and needs. Update all needed roads to ensure existing standards are met. Updates may include reconstruction, relocation or maintenance of roadways so they are in a stable condition. During the updates, use BMPs for minimal impact on the watershed.

Decommissioning roads no longer needed for access, that are temporary in nature, that are causing environmental damage or that are redundant.

9. What are the social / resource implications of no actions?
With only limited road maintenance and no decommissioning, roads will fail causing irreparable resource damage. Road fill and culvert failures will have an impact on stream quality. Public safety is also a concern with no action. To protect individuals from failing roads, road closures would be a common occurrence. Limited to no maintenance leads to structure failures of culverts, bridges and road fills. As road densities in the assessment area are considered high, by no action, there will be a continued adverse affects on the wildlife.

10. What are some of the foundational elements used in shaping your responses?
Nez Perce National Forest Plan
Selway Middle Fork Subbasin Assessment
CFR 36, Part 212, Travel Management Rule - Subpart A
Interior Columbia Basin Assessment

(Emphasis added.) From 111017WildlifeClearCreekNFMAComments.docx[9]:

[9] Included, as titled, with our objection documents.

> What's broke / at risk (threats) (this is all based on roads which are likely the largest cumulative effects out there. I believe we need to manage motorized uses in identified "sacrifice areas" and restrict motorized use in high quality habitats. I believe there is demand for a restricted roaded setting for hunters to use roads in a non-motorized setting.

From 110606NFMAQuestionsKaren.docx[10]:

> What's broke / at risk
> Roads are the major contributor of sediment to streams, especially at stream crossings. Ditchlines can direct flow and road surface sediment into perennial streams at crossings. These can be a chronic (ongoing) source of sediment to streams. Culverts at crossings are mostly undersized which greatly increases the risk of plugging and failure. Crossing failures can contribute large amounts of sediment to streams. They can be costly to fix and the sediment delivered to streams can take decades to flush out of the system. Road failures also disturb existing vegetation and expose bare soil to potential erosion until the site heals.

The EA fails to demonstrate compliance with all relevant forest plan standards, in violation of the Forest Plan and NFMA. The EA violates the Travel Management Regulations at 36 CFR § 212. It also violates NEPA by failing to use the best available science, and by failing to disclose project inconsistency with the Travel Management Regulations.

The EA also fails to demonstrate the FS is managing the project area and forest consistent with 36 CFR 212 Subparts B and C. And the FS cannot comply with 36 CFR 212 Subpart A, if it cannot accurately disclose the extent of its motorized travel network.

Remedy:
1. Disclose the following information concerning the project area:
- The deferred road maintenance backlog
- The annual road maintenance funding needs
- The annual road maintenance budget
- The capital improvement needs for existing roads
- The road density in the project area
- The number of miles of project area roads that fail to meet BMP standards or design standards
- If adequate maintenance funding will exist for the post-project road network, and disclose how deferred maintenance costs might increase or decrease post-project.

2. Prepare an EIS that incorporates the minimum road system prepared in compliance with the Travel Management Rule.

[10] Included, as titled, with our objection documents.

ELK

In the scoping comments, FOC noted that there are remaining unroaded parcels, including around White Pine Creek and Blakes Fork. FOC also expressed a concern about roads, including the construction of more roads. Roads adversely impact wildlife. And FOC stated the Forest Service must analyze the cumulative impacts from all past and proposed projects, including the land exchange where national forest land has become state trust lands which the state has heavily logged. For elk specifically, in the scoping letter the Forest Service even noted, under "Other Known Resource Concerns," that "Blake's Fork may have elk security areas." Yet the EA does not discuss elk at all. And the wildlife report ignores any discussion or disclosure on Blake's Fork.

Wildlife report states this is a management indicator species and may occur in suitable habitats, but even in the wildlife report did not discuss what was the best available population information or what was used to analyze the population viability. And the wildlife report noted that the "[u]nauthorized motorized use of closed roads would likely continue to reduce security habitat."

The Forest Service has violated NEPA here because it acknowledged possible existing security-habitat issues, recognized that the unauthorized motorized use of closed roads could further reduce that habitat, and still failed to look into this issue. The Forest Service has violated NEPA by not disclosing to the public how and with what information the agency analyzed population viability. And the Forest Service has violated NEPA by not accounting for the cumulative effects on elk and elk security habitat from nearby projects as well as the logging that is happening on state land. State activities and the cumulation of logging projects and increasing sparse areas of elk habitat in this particular ranger district may significantly impact elk.

Remedies:
1) Withdraw the project permanently; or
2) Conduct an environmental impact statement to determine the impact of cumulative effects on elk.

FISHER

We noted in our scoping comments that the proposed action had indicated that an assessment was underway in late 2018 for old-growth species. We asked about any updates to sensitive species in January of 2019, and received no response from the Forest Service.

We incorporate our discussion on the fisher from our comments on the Draft Forest Plan and EIS (pp. 227-236).

The Forest Service is not taking a hard look at impacts to fisher, nor has disclosed the existing condition of the well-being of this species. As a result, there is a potential for significant impact, so the project must be withdrawn and dropped, or the Forest Service must conduct an environmental impact statement, regardless of what we are concerned is unlawful Region 1 directive to do less. *See* USDA 2019b.

Fisher are special. "(T)he fisher is unique to North America and is valued by native and nonnative people as an important member of the complex natural communities that comprise the continent's northern forests. Fishers are an important component of the diversity of organisms found in North America, and the mere knowledge of the fisher's existence in natural forest communities is valued by many Americans." Ruggiero et al. 1994b.

The Lolo Insects and Disease FEIS discloses that "Fishers have a …state rank of S1 (critically imperiled) (Nature Serve 2017)." Fisher populations in the Clearwater are genetically unique (see Schwartz 2007). As such, they take on even more importance from a conservation perspective.

Research heavily associates fishers with older forests throughout the year. (Aubry et al. 2013, Olsen et al. 2014, Raley et al. 2012, Sauder 2014, Sauder and Rachlow 2014, Wier and Corbould 2010). Fine spatial scales of habitat that fisher need is well-studied. Fishers need dense overhead cover, abundant coarse woody debris, and large trees. (Aubry et al. 2013, Sauder and Rachlow 2014). The Forest Service recognizes that "[f]ishers are associated with areas of high cover and structural complexity in large tracts of mature and old-growth forests." Revised Forest Plan DEIS Ch. 1 p. 15; *see also* DEIS 3.2.3.2-83. Female fishers use cavities in large-diameter live trees and snags because tree cavities regulate temperatures and protect kits from predators; "[H]eartwood decay and cavity development is more important to fishers for denning than is the tree species." Raley et al. 2012. Research has found that females more often use dens in live trees with decay. Live trees have more regulated thermal properties and stable microclimates, so the temperature fluctuates less and kits are protected from weather extremes. Fishers rest primarily in deformed or deteriorating live trees. Raley et al. 2012.

Forest patterns are divided into forest composition and forest configuration, and fishers need both. Forest composition is a patch area or proportion of landscape specific to a habitat type. Habitat loss is mostly a change in forest composition. Forest configuration, on the other hand, is spatial and accounts for how patches are arranged across the landscape, like average patch shape, distances between patches of the same type, and the cluster of patches across the landscape. Sauder and Rachlow 2014.

Forest configuration figures just as much into the type of habitat that fisher need, specifically the proximity of mature forest patches. Sauder and Rachlow 2014 found that fishers in the Clearwater used landscapes with large patches of mature forest arranged in connected patterns. The proximity among mature forest patches was a stronger predictor of fisher use than the mere abundance of mature forest. Sauder and Rachlow 2014.

Most studies have found that fishers are reluctant to stray from forest cover and that they prefer more mesic forests (Olson et al. 2014, Sauder 2014, Sauder and Rachlow 2014, Weir and Corbould 2010). Both Sauder and Rachlow (2014) and Weir and Corbould (2010) predicted the influence of openings on fisher habitat occupancy based on their data. For example, Weir and Corbould predicted that a 5% increase in forest openings would decrease the likelihood of fisher occupancy by 50%. Sauder and Rachlow (2014) suggested that an "increase of open area from 5% to 10% reduces the probability of occupation by fishers by 39%. Sauder and Rachlow (2014) reported that the median amount of open area within fisher home ranges was 5.4%. This was consistent with "results from California where fisher home ranges, on average, contained <5.0%

open areas" (Raley et al. 2012). "[R]relatively small changes in the amount of open area in a landscape can have large effects on the probability of occupation by fishers." Sauder and Rachlow 2014. Indeed, Weir and Corbould (2010) states that the abundance of open areas within a landscape was the most important variable in predicting landscape occupancy by fishers. *See also* Sauder and Rachlow 2014.

The NPCNF's Lolo Insects and Disease FEIS states, "Availability of large diameter logs (greater than 21 inches dbh) **appeared to be particularly important in winter habitat selection**." (Emphasis added.) How that particularly important habitat feature was modeled or used in any estimate(s) of fisher habitat availability in the White Pine project area is impossible to determine.

Jones and Garton, 1994 noted "Fishers seemed to prefer large-diameter Engelmann spruce trees and **hollow grand fir logs as resting sites in north-central Idaho** (Jones 1991)." (Emphasis added.) Yet the White Pine EA indicates the FS believes grand fir are an undesirable species in the project area.

The whole point of tree farming is to minimize the loss of commercial value. Unfortunately that's the premise of the purpose and need of the White Pine project—to prevent dead trees and down logs from happening. Yet there's no cumulative effects analysis that discloses what such actions across the Forest will mean for fisher.

Sauder and Rachlow (2014) report the average home range size is approximately 12,200 acres and for a female fisher and approximately 24,300 acres for a male fisher. Home ranges generally do not overlap greatly for the individual sexes (21.3% for females and 15.3% for males), but male home ranges can overlap female home ranges. Preferred habitat would likely occur in upland areas and stands composed of cedar and grand fir forests (Schwartz et al. 2013).

Sauder, 2014 found that "fishers selected landscapes for home ranges with larger, more contiguous patches of mature forest arranged in connected, complex shapes with few isolated patches and open areas comprising ≤ 5% of the landscape" (Sauder and Rachlow 2014).

Also Jones, (undated) recognizes the following:

> Roads are directly correlated with trapper access, and consequently, fisher vulnerability. Even in areas where fishers cannot be legally trapped, trapping pressure for other furbearers (i.e., marten) may contribute significantly to fisher mortality. Roads bisecting or adjacent to preferred habitats (i.e., drainage bottoms) have the greatest potential of increasing a trapper's probability of encountering fishers."

And Witmer et al., 1998 state, "The range and population levels of the fisher have declined substantially in the past century, primarily the result of trapping pressure and habitat alteration through logging (Powell and Zielinski 1994)."

Heinemeyer and Jones, 1994 stated,

> Fishers are susceptible to trapping, and are frequently caught in sets for other furbearers. Additionally, populations are vulnerable to trapping, as even light pressure may cause local extinction. Western fisher populations may have lower natality and higher natural mortality rates as compared to eastern populations. Consequently, western populations may be more susceptible to over-trapping. It has been suggested that incidental captures may limit population growth in some areas.

The FS provides little in the way of analysis of fisher cumulative habitat impacts. In Washington, Hayes and Lewis, 2006 noted, "Trapping reduced populations quickly. Despite decades of protection from harvest, fisher populations never recovered in Washington. …The fisher was listed as endangered in Washington in 1998 by the Washington Fish and Wildlife Commission and is now considered likely extirpated from the state."

Sauder (2014) suggests that five National Forests (Clearwater, Nez Perce, Coeur d'Alene, Kaniksu, and Kootenai) hold the key to recovery of the species in the Northern Region. As with most of the Sensitive wildlife, fishers receive little habitat protection emphasis in current forest plans. Both the Clearwater and the Nez Perce Forest Plans list fisher as an old-growth-dependent species. The old-growth standards for both of these forests are five percent old-growth per drainage and ten percent old-growth forestwide. As discussed in the old-growth section, there is likely significant uncertainty on the real abundance of old growth and whether these areas are connected.

Ruggiero et al.,1994b discuss fisher habitat disruption by human presence:

> …The fisher's reaction to humans in all of these interactions is usually one of avoidance. Even though mustelids appear to be curious by nature and in some instances fishers may associate with humans (W. Zielinski, pers. obs.), they seldom linger when they become aware of the immediate presence of a human. In this regard, fishers generally are more common where the density of humans is low and human disturbance is reduced. Although perhaps not as associated with "wilderness" as the wolverine (V. Banci, Chapter 5), the fisher is usually characterized as a species that avoids humans (Douglas and Strickland 1987; Powell 1993).

When compared to the above description of the habitat in which fishers thrive, one can see the Forest Service's description of how to increase the health of tree stands for logging is not compatible with science that recognizes tree death as a natural process and the process that leads to the kind of habitat relied upon by species that need older, unlogged forests.

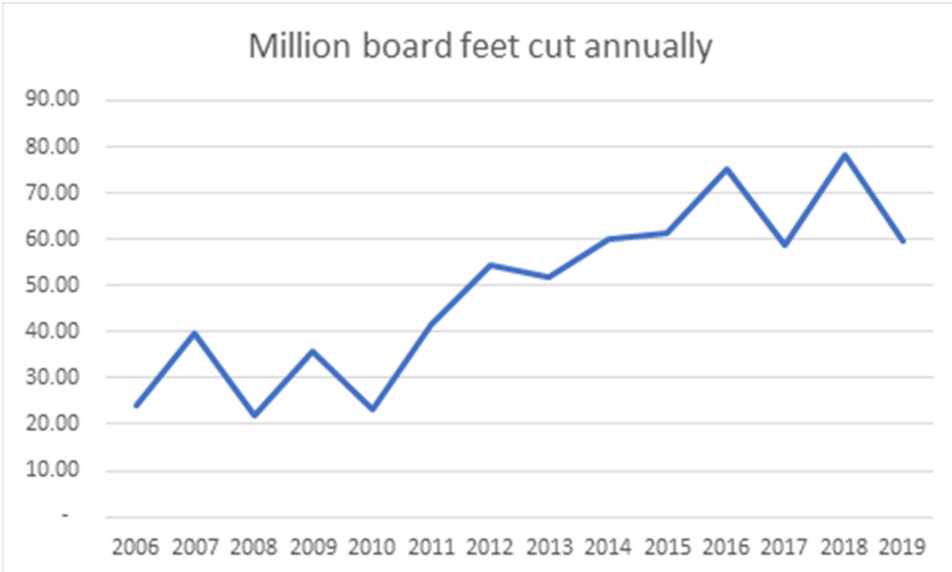
We are concerned that the Forest Service does not have a pulse on the existing condition of the fisher in this area or anywhere on the forest, making any finding that there would be no significant impact unsupported. The EA fails to address fisher entirely, and according to a forest-plan-revision map, regeneration logging overlaps with fisher habitat that appears to be a habitat corridor. *See* USDA 2019a. Isolating habitat by fragmenting it negatively impacts species. *See* Laurance 2008. Pulsford et al. 2015 describes the importance of habitat connectivity.

The wildlife report for this project discusses some long-term direct adverse impacts to this sensitive species for the habitat impacted. Yet, the EA or draft decision notice doesn't acknowledge this potential impact or provide convincing reasons as to why this project, in eliminating a habitat corridor, wouldn't have significant impacts on the fisher. For these reasons the EA is insufficient and doesn't take a hard look at the impacts of logging and the cumulative effects from other nearby projects.

The fisher is a sensitive species in Region 1 and the threats to this species have increased, if anything. We don't think the Forest Service has done near enough in protecting the species or its habitat on Forest System Lands to ensure this species is not on a road to listing under the Endangered Species Act. The best available information—the existing information—we have for this species suggests it may very well be in trouble. The most recent information that we could find the Forest Service producing are the relatively low numbers in a Nez Perce 2002 monitoring report—the Forest Service chose not to monitor fisher on the Clearwater even though this forest has fisher habitat.

There have been cumulative impacts from trapping over the past twenty years, and this doesn't seem to have figured into the Forest Service's assessment of impacts on fisher. Trapping is allowed on the Nez Perce-Clearwater National Forest. IDFG has reported that, since 2012, traps set for wolves have caught 56 fisher, 20 of whom died in the traps. *See* IDFG Non-target wolf trapping LICYEAR2013-2019 spreadsheet in "IDFG pub rec to WWP." The past eight years of wolf trapping has resulted in some concerning impacts to fisher. For example, in the 2013-2014 season, IDFG reported that 22 fisher were trapped that season, 10 of whom died in traps. While the trappers reporting these numbers indicated the balance were released, we don't know if trapping contributed to mortality shortly thereafter. Also, these are just the numbers reported, so we don't know if there were more unreported, either because trappers chose not to or did not check their traps. While we don't know where this trapping occurred, the Forest Service has recognized that the Nez Perce-Clearwater contains a lot of fisher habitat, so it follows that at least some of these numbers were likely from this forest. Also, it is very reasonably foreseeable that trapping is going to increase for several reasons. The first reason is that IDFG extended its wolf trapping season, so active traps will exist longer on the landscape, and these season modifications impact parts of both the Nez Perce and Clearwater National Forests. *See* IDFG 2020a, compare with IDFG 2020b (hunting units map). The second reason is that trapping depends on access. This project proposes fifteen miles of temporary roads and additional permanent roads, which will create more access for trappers. Finally, as stated above, Heinemeyer and Jones 1994 stated that even light pressure can cause local extinction, which is a significant impact.

Habitat loss has cumulatively impacted the fisher as well. The Forest Service has increased logging on the Nez Perce and Clearwater National Forests, some of the highest amounts of timber sold over the last 20 years occurring in the last four of five. Below we used the cut and sold reports from Region 1 for the Nez Perce and Clearwater National Forests to track the logging trend in million board feet:



We couldn't find any information about how the modeled suitable habitat accounts for what the Forest Service has logged. What has the Forest Service done to validate this habitat model?

Additionally, the Forest Service has recently approved a nearby project on this same ranger district, the Little Boulder Project, which will very likely be approved shortly, but is not yet logged. And the Strychnine Pine project eliminated habitat, too, and we don't know if logging is currently underway or the status of that project. (Please see the "Little Boulder and Strychnine Pine" folder submitted with this objection.) There is no cumulative effects analysis that considers the impacts of these project with the impacts from the White Pine project as it pertains to fisher, both in terms of number of acres of habitat altered or how the spatial aspect of altered habitat exacerbates habitat fragmentation.

"[S]pecies at the brink have been pushed to a critical conservation status because of human activities…" Ceballos et al. 2020. Habitat fragmentation is among these reasons, including simplifying the complex structure of old growth. Trapping is another reason. The Forest Service must account the actual population of fisher or validate some confident modeling, and there seems to be none of that.

These impacts must be analyzed with the impacts of global warming to fisher. McKelvey and Buotte 2018.

For the above reasons, the Forest Service has not complied with the National Environmental Policy Act. There hasn't been a hard look, there is no recent information about the population of this species on the Nez-Clear or an attempt to figure out if the habitat models point to places where fisher indeed occupy. You haven't disclosed to the public any high-quality information on this.

Remedy:
1) Withdraw the project; or

2) conduct an environmental impact statement that provides the public with the information described above that is lacking.

CANADA LYNX

Our January 7, 2019 comment letter mentioned Threatened species on the first page. The White Pine EA does not contain analysis for the Canada lynx. In fact, it has no discussion whatsoever for Sensitive terrestrial animals.

The Wildlife Report says the Canada lynx "Uses mature forests for denning and early seral stages (especially dense lodgepole pine) for foraging; snowshoe hares are primary prey." That description of habitat omits connectivity of this rare, wide-ranging species. The Wildlife Report considers this species in detail because the lynx "May occur in suitable habitats."

The Wildlife Report states, "The Forest is regarded as secondary occupied habitat. No Lynx Analysis Units (LAUs) or modeled suitable habitat is present within the project area. However, dispersing lynx may utilize the project area."

Apparently because the project area is only considered "secondary" habitat, the Wildlife Report essentially dismisses the species:

> All management practices and activity objectives, standards and guidelines apply to management projects in Canada Lynx Analysis Units (LAUs) and in Linkage Areas. No LAUs and no modeled lynx habitat is present on the District. No Linkage Areas are identified in the vicinity of the Project, so the Linkage Area objective, standard, and guidelines do not apply to the project. No designated critical Canada lynx habitat is identified within the Forest's boundary, thus the project area does not include any Canada lynx critical habitat.

"Secondary" habitat was automatically omitted from Critical Habitat under the Endangered Species Act (ESA), which in turn means the FS avoids analysis of impacts to critical habitat "primary constituent elements" which, according to the FS's Betty Baptiste Environmental Assessment, Flathead National Forest (2018) are:

> By definition …the physical and biological features essential to conservation of the lynx, …in an appropriate quantity and spatial arrangement (USDI 2008). Based on the current knowledge of the life history, biology, and ecology of the lynx, the PCE and its four components for lynx Critical Habitat are:
> 1. Boreal forest landscapes supporting a mosaic of differing successional forest stages and containing:
> a) Presence of snowshoe hares and their preferred habitat conditions, which include dense understories of young trees, shrubs or overhanging boughs that protrude above the snow, and mature multistoried stands with conifer boughs touching the snow surface (PCE 1a);
> b) Winter snow conditions that are generally deep and fluffy for extended periods of time (PCE 1b);

> c) Sites for denning that have abundant coarse woody debris, such as downed trees and root wads (PCE 1c); and
> d) Matrix habitat (e.g., hardwood forest, dry forest, non-forest, or other habitat types that do not support snowshoe hares) that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through such habitat while accessing patches of boreal forest within a home range (PCE 1d).

The FS downplays documented resident lynx on the CNF as "transient" rather than considering any possibility for lynx to be breeding here. As stated in the CNF's Lolo Insect & Disease EIS: "The CNF considers lynx may be present as transients moving through the forest during dispersal events: which does not suggest that lynx are breeding, denning, or rearing young currently on the CNF." In other words, to the FS lynx on the CNF are homeless rogues not entitled to full Forest Plan protection. This places the onus of protection on the species itself, which apparently must show up in a Forest Service office with a litter of kittens, a news release, and a banner to get recognized as legitimate residents.

The Report's analysis of "Cumulative Effects" entirely consists of:

> Noo MSH or LAUs are present within the project area, or Palouse Ranger District. However, transient lynx could use the project area or surrounding habitat. The project would not limit dispersal or movement of the species through the project area, LAUs, or District. In addition to management direction compliance, this determination is based on the limited severity of the effects given the combination of relatively short-term disturbance impacts and relatively small scale long-term habitat conversions.
>
> Alternative 2, in combination with reasonably foreseeable future actions, may impact individual lynx or their habitat, but are not likely to result in a trend toward federal listing or reduced viability for the populations or species within the project area or range wide.

Yet that conclusion is mainly a regurgitation of direct effects and has no acknowledgment of factors which endanger the lynx across a wider range. This does not satisfy NEPA's requirements to "take a hard look" at cumulative effects. It fails to acknowledge impacts of other ongoing management actions, such as authorization of motorized activity and expansion of the road network in the project area. The analysis area for cumulative impacts on lynx is properly much larger than the project area, but the FS fails to identify the proper cumulative effects analysis area for and thus avoids take a "hard look." Below we cite some scientific information the FS apparently wants to ignore.

The FS fails to disclose how many acres of forest would be made uninhabitable for and avoided by lynx especially in winter due to the large openings created. Openings, whether small in uneven-aged management, or large with clearcutting, remove lynx winter travel habitat on those affected acres, since lynx avoid openings in the winter (Squires et al. 2010). Existing openings such as clearcuts not yet recovered are likely to be avoided by lynx in the winter (Squires et al.

2010, Squires et al. 2006a). The average width of openings crossed by lynx in the winter was 383 feet, while the maximum width of crossed openings was 1240 feet (Squires et al. 2010). Winter is the most constraining season for lynx in terms of resource use; starvation mortality has been found to be the most common during winter and early spring. (*Id*.) The FS fails to analyze habitat fragmentation or connectivity within any LAU or between adjoining LAUs.

The FS fails to analyze cumulative impacts of past fire suppression on lynx habitat, a factor which is a justification of the project. The FS fails to conduct an analysis comparing the historic, pre-management conditions of lynx habitat components with current conditions.

Lynx subsist primarily on a prey base of snowshoe hare, and survival is highly dependent upon snowshoe hare habitat, forest habitat where young trees and shrubs grow densely. In North America, the distribution and range of lynx is nearly coincident with that of snowshoe hares, and protection of snowshoe hares and their habitat is critical in lynx conservation strategies.

Lynx are highly mobile and generally move long distances [greater than 60 mi. (100 km.)]; they disperse primarily when snowshoe hare populations decline; subadult lynx disperse even when prey is abundant, presumably to establish new home ranges; and lynx also make exploratory movements outside their home ranges. 74 Peg. Reg. at 8617.

Lynx winter habitat in older, multi-storied forests, is critical for lynx preservation. (Squires et al. 2010.) The also reported that lynx winter habitat should be "abundant and spatially well-distributed across the landscape" (Squires et al. 2010; Squires 2009) and in heavily managed landscapes, retention and recruitment of lynx habitat should be a priority.

Prey availability for lynx is highest in the summer. (Squires et al., 2013.)

The Lynx Conservation Assessment and Strategy (LCAS 2000) noted that lynx prefer to move through continuous forest (1-4); lynx have been observed to avoid large openings, either natural or created (1-4); opening and open forest areas wider than 650 feet may restrict lynx movement (2-3); large patches with low stem densities may be functionally similar to openings, and therefore lynx movement may be disrupted (2-4). Squires et al. 2006a reported that lynx tend to avoid sparse, open forests and forest stands dominated by small-diameter trees during the winter.

Kosterman, 2014 found that 50% of lynx habitat must be mature undisturbed forest for it to be optimal lynx habitat where lynx can have reproductive success and no more than 15% of lynx habitat should be young clearcuts, i.e. trees under 4 inched dbh. Young regenerating forest should occur only on 10-15% of a female lynx home range, i.e. 10-15% of an LAU. This renders inadequate the Forest Plan/NRLMD assumption in that 30% of lynx habitat can be open, and that no specific amount of mature forest needs to be conserved. Kosterman, 2014 demonstrates that Forest Plan/NRLMD standards are not adequate for lynx viability and recovery.

Other recent science also undermines the adequacy of the Forest Plan/NRLMD. Holbrook, et al., 2018 "used univariate analyses and hurdle regression models to evaluate the spatio-temporal factors influencing lynx use of treatments." Their analyses "indicated …there was a consistent cost in that lynx use was low up to ~10 years after **all silvicultural actions**." (Emphasis added.) From their conclusions:

> First, we demonstrated that lynx clearly use silviculture treatments, but there is a ~10 year cost of implementing any treatment (thinning, selection cut, or regeneration cut) in terms of resource use by Canada lynx. This temporal cost is associated with lynx preferring advanced regenerating and mature structural stages (Squires et al., 2010; Holbrook et al., 2017a) and is consistent with previous work demonstrating a negative effect of precommercial thinning on snowshoe hare densities for ~10 years (Homyack et al., 2007). Second, if a treatment is implemented, Canada lynx used thinnings at a faster rate post-treatment (e.g.,~20 years posttreatment to reach 50% lynx use) than either selection or regeneration cuts (e.g., ~34–40 years post-treatment to reach 50% lynx use). Lynx appear to use regeneration and selection cuts similarly over time suggesting the difference in vegetation impact between these treatments made little difference concerning the potential impacts to lynx (Fig. 4c). Third, Canada lynx tend to avoid silvicultural treatments when a preferred structural stage (e.g., mature, multi-storied forest or advanced regeneration) is abundant in the surrounding landscape, which highlights the importance of considering landscape-level composition as well as recovery time. For instance, in an area with low amounts of mature forest in the neighborhood, lynx use of recovering silvicultural treatments would be higher versus treatments surrounded by an abundance of mature forest (e.g., Fig. 3b). This scenario captures the importance of post-treatment recovery for Canada lynx when the landscape context is generally composed of lower quality habitat. Overall, these three items emphasize that both the spatial arrangement and composition as well as recovery time are central to balancing silvicultural actions and Canada lynx conservation.

So Holbrook et al., 2018 fully contradict Forest Plan assumptions that clearcuts/regeneration can be considered useful lynx habitat within 25 years post-logging.

Vanbianchi et al., 2017, who found, "Lynx used burned areas as early as 1 year postfire, which is much earlier than the 2–4 decades postfire previously thought for this predator."

Kosterman, 2014, Vanbianchi et al., 2017 and Holbrook, et al., 2018 each demonstrate that Forest Plan/NRLMD direction is not adequate for lynx viability and recovery, as the FS assumes.

Squires et al. (2013) noted that long-term population recovery of lynx, as well as other species as the grizzly bear, require maintenance of short and long-distance connectivity. Lynx linkage zones for landscape habitat connectivity are necessary to allow for movement and dispersal of lynx. Lynx avoid forest openings at small scales, however effects on connectivity from project-created or cumulative openings were not analyzed in terms of this smaller landscape scale. And connectivity between project area LAUs and adjacent LAUs was not analyzed or disclosed.

The FS fails to analyze and disclose how much lynx habitat is affected by snowmobiles and other recreational activities. *See* Ruediger, et al., 2000.

The Wildlife Report concludes: "Alternative 2, in combination with reasonably foreseeable future actions, may impact individual lynx or their habitat, but are **not likely to result in a trend toward federal listing** or reduced viability for the populations or species within the project area or range wide." (Emphasis added.) Please note that the Canada lynx is already listed as a Threatened species. Thus the overall population's viability is already significantly reduced.

Because the FS does not consider the best available science and for the reasons stated herein, the FS is unable to demonstrate it is managing consistent with NEPA, NFMA, the Forest Plan and the ESA. The inadequacy of cumulative effects analysis also violates NEPA.

We incorporate our discussion on the Canada lynx from our comments on the Draft Forest Plan and EIS (pp. 209-219).

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies identified above.

WOLVERINE

Our January 7, 2019 comment letter mentioned Sensitive species on the first page. The White Pine EA does not contain analysis of the wolverine. In fact it has no discussion whatsoever for Sensitive terrestrial animals.

The Wildlife Report says wolverine habitat is "Remote areas where human disturbance is minimal, often in timber near rockslides, avalanche areas, cliffs, swamps, and meadows." That description of habitat omits connectivity for this rare, wide-ranging species. The Wildlife Report considers this species in detail because the wolverine "May occur in suitable habitats."

The report states, "the primary indicator of wolverine habitat is deep, persistent, reliable spring snow cover (Copeland et al. 2010). In Idaho, wolverines inhabit montane, mature forests associated with subalpine rock/scree habitats in areas of low human occurrence (IDFG 2014a), which are used for foraging and natal denning. …No deep persistent snow and no modeled suitable habitat are present within the project area. However, dispersing wolverines may utilize the project area."

The Wildlife Report's complete analysis of direct and indirect project impacts on the wolverine consists of:

> If transient wolverines were present in the project area, they could be directly affected by the proposed project activities. The increase in human and equipment activity in the project area during implementation of Alternative 2 could disturb individual wolverines within the project area. However, this disturbance is not expected to affect their survival or reproduction. Mature individuals could move away from implementation areas and should not be injured or killed.

> No MSH, deep persistent snow, or talus slopes, the preferred denning habitat for wolverines, are present within the project area. Few effects to wolverine have been documented from land management activities like regeneration harvest. However, wolverines are documented to use recently logged and burned areas despite the loss of canopy cover.

Again, a native wildlife species is characterized as a "transient."

The Report's analysis of "Cumulative Effects" entirely consists of:

> No North American wolverine MSH[11] is present within the Palouse Ranger District. Much of the area is of a lower elevation than typically used by wolverines. However, a transient wolverine could be disturbed or displaced by timber harvest.
>
> The degree of impacts from the Project to North American Wolverine is not significant because it was determined the proposed action would not jeopardize the continued existence of the Distinct Population Segment of the North American wolverine. This is because: (1) the project would not contribute to the identified primary or secondary threats (climate change, inadequate regulation of climate change, harvest, and small population size); (2) none of the proposed activities are considered a threat; (3) individual project activities and cumulative actions would result in relatively small-scale disturbances in relation to their home range size; (4) they are able to adjust to and co-exist with moderate levels of disturbance; and (5) the project and it's cumulative effects would not result in barriers to dispersing individuals.
>
> Alternative 2, in combination with reasonably foreseeable future actions, may impact individual wolverines or their habitat, but are not likely to result in a trend toward federal listing or reduced viability for the populations or species within the project area or range wide.

Yet that conclusion is mainly a regurgitation of direct effects and a vague acknowledgment of factors which endanger the wolverine across a wider range. This does not satisfy NEPA's requirements to "take a hard look" at cumulative effects. It fails to acknowledge impacts of other ongoing management actions, such as authorization of motorized activity and expansion of the road network in the project area. And although the report suggests that the analysis area for cumulative impacts on wolverines is properly much larger than the project area, it fails to identify the proper cumulative effects analysis area for the wolverine and thus avoids take a hard look at cumulative impacts therein. The NPCNF Draft Revised Forest Plan and Draft EIS indicate the FS doesn't believe the NPCNF is geographically large enough to have the minimum number of reproductive wolverines to meet viability criteria.

Below we cite some scientific information the FS apparently wants to ignore.

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[11] "Modeled suitable habitat"

Wolverines use habitat ranging from Douglas-fir and lodgepole pine forest to subalpine whitebark pine forest (Copeland et al., 2007). Lofroth (1997) in a study in British Columbia, found that wolverines use habitats as diverse as tundra and old-growth forest. Wolverines are also known to use mid- to low-elevation Douglas-fir forests in the winter (USDA Forest Service, 1993).

Aubry, et al. 2007 note that wolverine range in the U.S. had contracted substantially by the mid-1900s and that extirpations are likely due to human-caused mortality and low to nonexistent immigration rates.

May et al. (2006) cite: "Increased human development (e.g. houses, cabins, settlements and roads) and activity (e.g. recreation and husbandry) in once remote areas may thus cause reduced ability of wolverines to perform their daily activities unimpeded, making the habitat less optimal or causing wolverines to avoid the disturbed area (Landa & Skogland 1995, Landa et al. 2000a)."

Ruggiero, et al. (2007) state: "Many wolverine populations appear to be relatively small and isolated. Accordingly, empirical information on the landscape features that facilitate or impede immigration and emigration is critical for the conservation of this species."

Roads result in direct mortality to wolverines by providing access for trappers (Krebs et al., 2007). Trapping was identified as the dominant factor affecting wolverine survival in a Montana study (Squires et al. 2007). Female wolverines avoid roads and recently logged areas, and respond negatively to human activities (Krebs et al., 2007)

Ruggiero et al. (1994b) recognized that "Over most of its distribution, the primary mortality factor for the wolverines is trapping." Those authors also state, "Transient wolverines likely play a key role in the maintenance of spatial organization and the colonization of vacant habitat. Factors that affect movements by transients may be important to population and distributional dynamics."

Roads and human density are important factors influencing current wolverine distribution (Carroll et al. 2001b); and wolverine habitat selection is negatively correlated with human activity – including roads (Krebs et al. 2007). Wolverine occurrence has shown a negative relationship with road densities greater than 2.8 mi/mi^2 (1.7 km/km^2) (Carroll et al. 2001b).

(T)he presence of roads can be directly implicated in human-caused mortality (trapping) of this species. Trapping was identified as the dominant factor affecting wolverine survival in a Montana study (Squires et al. 2007).

Krebs et al. (2007) state, "Human use, including winter recreation and the presence of roads, reduced habitat value for wolverines in our studies."

Wisdom et al. (2000) state:

> Carnivorous mammals such as marten, fisher, lynx, and wolverine are vulnerable to over-trapping (Bailey and others 1986, Banci 1994, Coulter 1966, Fortin and Cantin

> 1994, Hodgman and others 1994, Hornocker and Hash 1981, Jones 1991, Parker and others 1983, Thompson 1994, Witmer and others 1998), and over-trapping can be facilitated by road access (Bailey and others 1986, Hodgman and others 1994, Terra-Berns and others 1997, Witmer and others 1998).
>
> …Snow-tracking and radio telemetry in Montana indicated that wolverines avoided recent clearcuts and burns (Hornocker and Hash 1981).
>
> Copeland (1996) found that human disturbance near natal denning habitat resulted in immediate den abandonment but not kit abandonment. Disturbances that could affect wolverine are heli-skiing, snowmobiles, backcountry skiing, logging, hunting, and summer recreation (Copeland 1996, Hornocker and Hash 1981, ICBEMP1996f).

Carroll et al. (2001b) state:

> The combination of large area requirements and low reproductive rate make the wolverine vulnerable to human-induced mortality and habitat alteration. Populations probably cannot sustain rates of human-induced mortality greater than 7–8%, lower than that documented in most studies of trapping mortality (Banci 1994, Weaver et al. 1996).
>
> … (T)he present distribution of the wolverine, like that of the grizzly bear, may be more related to regions that escaped human settlement than to vegetation structure.

Wisdom et al. (2000) offered the following strategies:

- Provide large areas with low road density and minimal human disturbance for wolverine and lynx, especially where populations are known to occur. Manage human activities and road access to minimize human disturbance in areas of known populations.
- Manage wolverine and lynx in a metapopulation context, and provide adequate links among existing populations.
- Reduce human disturbances, particularly in areas with known or high potential for wolverine natal den sites (subalpine talus cirques).

Copeland et al. 2010 state, "Available evidence …indicates that connectivity among wolverine populations is essential for maintaining viability in fragmented portions of their range (Flagstad et al. 2004; Cegelski et al. 2003, 2006; Schwartz et al. 2007)."

Logging and road activities may affect wolverines; published, peer-reviewed research finds: "Roaded and recently logged areas were negatively associated with female wolverines in summer." Fisher et al., 2013. The "analysis suggests wolverines were negatively responding to human disturbance within occupied habitat. The population consequences of these functional habitat relationships will require additional focused research." *Id.*

Results from Scrafford et al., 2018 "show that roads, regardless of traffic volume, reduce the quality of wolverine habitats and that higher-traffic roads might be most deleterious. We suggest that wildlife behavior near roads should be viewed as a continuum and that accurate modeling of behavior when near roads requires quantification of both movement and habitat selection. Mitigating the effects of roads on wolverines would require clustering roads, road closures, or access management."

Nowhere in the Forest Plan or project analysis can be found a description of the quantity and quality of habitat that is necessary to sustain the viability of the wolverine.

The FS fails to analyze and disclose cumulative impacts of recreational activities on wolverine. Our challenge to the CNF Travel Plan explains how the FS is failing to minimize impacts on Wolverine as required by the Travel Management Rule and Executive Orders.

The Analysis of the Management Situation Technical Report for Revision of the Kootenai and Idaho Panhandle Forest Plans states:

> Direct mortality (related to access) from trapping, legal hunting, and illegal shooting has impacted all wide-ranging carnivores (e.g. lynx, wolverine, grizzly and black bears, wolves)…
>
> …Wolverine populations may have declined from historic levels, as a result of over-trapping, hunting, habitat changes, and intolerance to human developments. As the amount of winter backcountry recreation increases, wolverine den sites may become more susceptible to human disturbance.

The FS's illogical wolverine determination may be based upon a 2013 memo from the Regional Office (USDA Forest Service 2013c). It appears that FS district level specialists are not allowed to arrive at effects conclusions based upon their own expertise and judgment.

We incorporate our discussion on the wolverine from our comments on the Draft Forest Plan and EIS (pp. 189-193).

The FS fails to consider and use the best available science and fails to insure population viability of the wolverine in violation of NFMA and additionally, violating NEPA's requirements that the FS demonstrate scientific integrity. *See* 36 C.F.R. 219.3; 40 C.F.R. 1502.24.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies identified above.

BLACK-BACKED WOODPECKER

Our January 7, 2019 comment letter mentioned Sensitive species on the first page, and black-backed woodpeckers specifically on the second page. The White Pine EA does not contain analysis of the black-backed woodpecker. In fact, it has no discussion whatsoever for Sensitive terrestrial animals.

The Wildlife Report says black-backed woodpecker habitat is "Abundant in recently burned landscapes or other areas of epidemic bark beetle infestation, uncommon but widespread elsewhere." That report doesn't consider this species in detail because: "Potential foraging habitat present due to insect and disease tree mortality but patchily distributed across project area. Insufficient areas of snags clustered at densities required for nest sites. Black-backed use of the project area expected to be low." Actually, the Wildlife Report has absolutely no analysis of the Sensitive black-backed woodpecker—direct, indirect, or cumulative.

Yet the EA justifies the project partly because of the specter of insect-takeover: "The actions proposed in this project are intended to reduce the risk and extent of insect and diseases within the project area…" Furthermore, the propose actions are meant to suppress this species' habitat: "There are suggested management strategies and alternatives for the most common insects and disease agents, including use of silvicultural practices aimed at maintaining healthy stands" and "Commercial harvest and associated reforestation is intended to improve forest stand resilience to insect and disease…"

FS biologists Hillis et al., 2002 note that "In northern Idaho, where burns have been largely absent for the last 60 years, black-backed woodpeckers are found amid bark beetle outbreaks, although not at the densities found in post-burn conditions in Montana." Those researchers also state, "The greatest concerns for this species, however, are decades of successful fire suppression and salvage logging targeted at recent bark beetle outbreaks." Hillis et al., 2002 also state:

> Black-backed woodpeckers occupy forested habitats that contain high densities of recently dead or dying trees that have been colonized by bark beetles and woodborer beetles (Buprestidae, Cerambycidae, and Scolytidae). These beetles and their larvae are most abundant within burned forests. In unburned forests, bark beetle and woodborer infested trees are found primarily in areas that have undergone natural disturbances, such as wind-throw, and within structurally diverse old-growth forests (Steeger and Dulisse in press, Bull et al. 1986, Goggans et al. 1987, Villard 1994, Hoffman 1997, Weinhagen 1998).

The Boise National Forest (USDA Forest Service, 2010d) adopted the black-backed woodpecker as an indicator species in its revised forest plan in 2010:

> The black-backed woodpecker depends on fire landscapes and other large- scale forest disturbances (Caton 1996; Goggans et al. 1988; Hoffman 1997; Hutto 1995; Marshall 1992; Saab and Dudley 1998). It is an irruptive species, opportunistically foraging on outbreaks of wood-boring beetles following drastic changes in forest structure and composition resulting from fires or uncharacteristically high density forests (Baldwin 1968; Blackford 1955; Dixon and Saab 2000; Goggans et al.1988; Lester 1980). Dense, unburned, old forest with high levels of snags and logs are also important habitat for this species, particularly for managing habitat over time in a well-distributed manner. These areas provide places for low levels of breeding birds but also provide opportunity for future disturbances, such as wildfire or insect and disease outbreaks (Dixon and Saab 2000; Hoyt and Hannon 2002; Hutto and Hanson 2009; Tremblay et al. 2009). Habitat that supports this species' persistence

> benefits other species dependent on forest systems that develop with fire and insect and disease disturbance processes. The black-backed woodpecker is a secondary consumer of terrestrial invertebrates and a primary cavity nester. Population levels of black-backed woodpeckers are often synchronous with insect outbreaks, and targeted feeding by this species can control or depress such outbreaks (O'Neil et al. 2001). The species physically fragments standing and logs by its foraging and nesting behavior (Marcot 1997; O'Neil et al. 2001). These KEFs influence habitat elements used by other species in the ecosystem. Important habitat elements (KECs) of this species are an association with medium size snags and live trees with heart rot. Fire can also benefit this species by stimulating outbreaks of bark beetle, an important food source. Black-backed woodpecker populations typically peak in the first 3–5 years after a fire. This species' restricted diet renders it vulnerable to the effects of fire suppression and to post-fire salvage logging in its habitat (Dixon and Saab 2000).
>
> … Black-backed woodpeckers are proposed as an MIS because of their association with high numbers of snags in disturbed forests, use of late-seral old forest conditions, and relationship with beetle outbreaks in the years immediately following fire or insect or disease outbreaks. Management activities, such as salvage logging, timber harvest, and firewood collection, can affect KEFs this species performs or KECs associated with this species, and **therefore its role as an MIS would allow the Forest to monitor and evaluate the effects of management activities on identified forest communities and wildlife species**. (Emphasis added.)

All the areas to be logged are potential habitat of the highest quality. All it takes is a fire, which could happen naturally or as a result of project activities. Those areas logged before a fire would have far less habitat value to this species. This is a cumulative effect ignored in the White Pine analyses.

The EA and Wildlife Report don't disclose the FS's strategy and best available science for insuring viable populations of the black-backed woodpecker.

Current forest management policies pose serious implications for the black-backed woodpecker. Forestwide suppression of habitat conditions would eliminate population viability. The Wildlife Specialist Report for the NPCNF's End of the World timber sale states, "By reducing the potential for stand-replacing wildfire and beetle outbreaks in the project area, project implementation would reduce the potential for black-backed woodpecker occupancy in the future in the project area." The White Pine EA indicates the FS doesn't want high quality black-backed woodpecker habitat to develop: "Fuels treatments are designed to reduce hazardous fuels within the treatment units and thereby reduce potential Rates of Spread (ROS) and Flame Length (FL) to the extent that all fires can be suppressed by hand using direct attack methods and the potential for large fire growth is drastically reduced."

The FS's analyses fail to quantify such impacts—directly, indirectly, and cumulatively. Such failures to quantify and meaningfully analyze and disclose cumulative effects is pervasive throughout the analyses for all ESA-listed, MIS, and Sensitive species.

Hutto, 2006 addresses this subject; from the Abstract:

> The bird species in western North America that are most restricted to, and therefore most dependent on, severely burned conifer forests during the first years following a fire event depend heavily on the abundant standing snags for perch sites, nest sites, and food resources. Thus, it is critical to develop and apply appropriate snag-management guidelines to implement postfire timber harvest operations in the same locations. Unfortunately, existing guidelines designed for green-tree forests cannot be applied to postfire salvage sales because the snag needs of snag-dependent species in burned forests are not at all similar to the snag needs of snag-dependent species in green-tree forests. Birds in burned forests have very different snag-retention needs from those cavity-nesting bird species that have served as the focus for the development of existing snag-management guidelines. Specifically, many postfire specialists use standing dead trees not only for nesting purposes but for feeding purposes as well. Woodpeckers, in particular, specialize on wood-boring beetle larvae that are superabundant in fire-killed trees for several years following severe fire. Species such as the Black-backed Woodpecker (Picoides arcticus) are nearly restricted in their habitat distribution to severely burned forests. Moreover, existing postfire salvage-logging studies reveal that most postfire specialist species are completely absent from burned forests that have been (even partially) salvage logged. I call for the long-overdue development and use of more meaningful snag-retention guidelines for postfire specialists, and I note that the biology of the most fire-dependent bird species suggests that even a cursory attempt to meet their snag needs would preclude postfire salvage logging in those severely burned conifer forests wherein the maintenance of biological diversity is deemed important.

Hutto, 2008 cautions against the common practice of landscape scale thinning to "restore" forests to a condition thought to be more congruent with historical conditions:

> Black-backed Woodpeckers …require burned forests that are densely stocked and have an abundance of large, thick-barked trees favored by wood-boring beetles (Hutto 1995, Saab and Dudley 1998, Saab et al. 2002, Russell et al. 2007, Vierling et al. 2008). Indeed, data collected from within a wide variety of burned forest types show that **the probability of Black-backed Woodpecker occurrence decreases dramatically and incrementally as the intensity of traditional (pre-fire) harvest methods increases.** (Emphases added.)

The Hutto, 2008 Abstract states:

> I use data on the pattern of distribution of one bird species (Black-backed Woodpecker, Picoides arcticus) as derived from 16,465 sample locations to show that, in western Montana, this bird species is extremely specialized on severely

> burned forests. Such specialization has profound implications because it suggests that the severe fires we see burning in many forests in the Intermountain West are not entirely "unnatural" or "unhealthy." Instead, severely burned forest conditions have probably occurred naturally across a broad range of forest types for millennia. These findings highlight the fact that severe fire provides an important ecological backdrop for fire specialists like the Black-backed Woodpecker, and that the presence and importance of severe fire may be much broader than commonly appreciated.

Please see Hanson Declaration, 2016 for an explanation of what a cumulative impact is with regard to the backed woodpecker, how the FS failed apply the best available science in their analysis of impacts to black-backed woodpeckers for a timber sale, why FS's (including Samson's) reports are inaccurate and outdated, and why FS's reliance on them results in an improper minimization of adverse effects and cumulative impacts to black-backed woodpeckers with regard to the agency's population viability assessment.

The viability of the black-backed woodpecker is threatened by fire suppression and other "forest health" policies which specifically attempt to prevent its habitat from developing. "Insect infestations and recent wildfire provide key nesting and foraging habitats" for the black-backed woodpecker and "populations are eruptive in response to these occurrences" (Wisdom et al. 2000). A basic purpose of the FS's management strategies is to negate the natural processes that the black-backed woodpecker biologically relies on; the emphasis in reducing the risk of stand loss due to stand density coupled with the increased risk of stand replacement fire events. Viability of a species cannot be assured, if habitat suppression is a forestwide policy.

Hutto, 1995 states: "Fires are clearly beneficial to numerous bird species, and **are apparently necessary for some**." (p. 1052, emphasis added.) Hutto, 1995 whose study keyed on forests burned in the 1988 season, noted:

> Contrary to what one might expect to find immediately after a major disturbance event, I detected a large number of species in forests that had undergone stand-replacement fires. Huff et al. (1985) also noted that the density and diversity of bird species in one- to two-year-old burned forests in the Olympic Mountains, Washington, *were as great as adjacent old-growth forests*…
>
> …Several bird species seem to be relatively *restricted* in distribution to early post-fire conditions… I believe it would be difficult to find a forest-bird species more restricted to a single vegetation cover type in the northern Rockies than the Black-backed Woodpecker is to early [first 6 years] post-fire conditions. (Emphasis added).

USDA Forest Service 2011c states:

> Hutto (2008), in a study of bird use of habitats burned in the 2003 fires in northwest Montana, found that within burned forests, there was one variable that exerts an influence that outstrips the influence of any other variable on the distribution of

> birds, and that is fire severity. Some species, including the black-backed woodpecker, were relatively abundant only in the high-severity patches. . **Hutto's preliminary results also suggested burned forests that were harvested fairly intensively (seed tree cuts, shelterwood cuts) within a decade or two prior to the fires of 2003 were much less suitable as post-fire forests to the black-backed woodpecker and other fire dependent bird species. Even forests that were harvested more selectively within a decade or two prior to fire were less likely to be occupied by black-backed woodpeckers.** (Emphasis added.)

Also see the agency's Fire Science Brief, 2009, which states, "Hutto found that Black-backed Woodpeckers fared best on sites unharvested before fire and poorest in the heavily harvested sites."

Hutto, 2008 states, "severely burned forest conditions have probably occurred naturally across a broad range of forest types for millennia. These findings highlight the fact that severe fire provides an important ecological backdrop for fire specialists like the black-backed woodpecker, and that the presence and importance of severe fire may be much broader than commonly appreciated."

Cherry (1997) states:

> The black-backed woodpecker appears to fill a niche that describes everything that foresters and fire fighters have attempted to eradicate. For about the last 50 years, disease and fire have been considered enemies of the 'healthy' forest and have been combated relatively successfully. We have recently (within the last 0 to 15 years) realized that disease and fire have their place on the landscape, but the landscape is badly out of balance with the fire suppression and insect and disease reduction activities (i.e. salvage logging) of the last 50 years. Therefore, the black-backed woodpecker is likely not to be abundant as it once was, and **continued fire suppression and insect eradication is likely to cause further decline.** (Emphasis added.)

FS management emphasis continues to suppress this species' habitat, as evident from the EA's Purpose and Need.

The black-backed woodpecker is a primary cavity nester, and also the closest thing to an MIS for species depending upon the process of wildland fire in the ecosystem. Cherry (1997) notes:

> Woodpeckers play critical roles in the forest ecosystem. Woodpeckers are primary cavity nesters that excavate at least one cavity per year, thus making these sites available to secondary cavity nesters (which include many species of both birds and mammals). Black-backed and three-toed woodpeckers can play a large role in potential insect control. The functional roles of these two woodpecker species could easily place them in the 'keystone' species category—a species on which other species depend for their existence.

> Wickman (1965) calculated that woodpeckers may eat up to 50 larvae per day that were each about 50 mm in length. The predation on these larvae is significant. It has been estimated that individual three-toed woodpeckers may consume thousands of beetle larvae per day, and insect outbreaks may attract a many-fold increase in woodpecker densities (Steeger et al. 1996). The ability of woodpeckers in to help control insect outbreaks may have previously been underestimated.

Cherry (1997) also notes:

> Black-backed woodpeckers preferred foraging in trees of 34 cm (16.5 in) diameters breast height and (63 ft) 19 m height (Bull et al. 1986). Goggans et al. (1987) found the mean dbh of trees used for foraging was 37.5 cm (15 in) and the mean dbh of trees in the lodgepole pine stands used for foraging was 35 cm (14 in). Steeger et al. (1996) found that both (black-backed and three-toed) woodpecker species fed in trees from 20-50 cm (8-20 in) dbh.
>
> Black-backed woodpeckers excavate their own cavities in trees for nesting. Therefore, they are referred to as primary cavity nesters, and they play a critical role in excavating cavities that are later used by many other species of birds and mammals that do not excavate their own cavity (secondary cavity nesters). Black-backed woodpeckers peel bark away from the entrance hole and excavate a new cavity every year. Other woodpeckers sometimes take over their cavities (Goggans et al. 1987).

Also, FS biologists Goggans et al., 1989 studied black-backed woodpecker use of unburned stands in the Deschutes NF in Oregon. They discovered that the black-backed woodpeckers used unlogged forests more than cut stands. In other words, effects to the black-backed woodpecker accrue from logging forest habitat that has not been recently burned.

Hutto and Gallo, 2006 state:

> Every timber-drilling and timber-gleaning species was less abundant in the salvage-logged plots, including two of the most fire-dependent species in the northern Rocky Mountains—American Three-toed (Picoides dorsalis) and Black-backed (P. arcticus) Woodpeckers. Lower abundances in salvage-logged plots occurred despite the fact that there were still more potential nest snags per hectare than the recommended minimum number needed to support maximum densities of primary cavity-nesters, which suggests that reduced woodpecker densities are more related to a reduction in food (wood-boring beetle larvae) than to nest-site availability.

Bond et al., 2012a explain the need for a conservation strategy for the black-backed woodpecker:

> In California, the Black-backed Woodpecker’s strong association with recently burned forest, a habitat that is ephemeral, spatially restricted, and often greatly modified by post-fire logging, as well as the species’ relative rarity, may make the woodpecker vulnerable to declines in the state. Additionally, Black-backed

> Woodpeckers in California are affected by the management of unburned forests – both because pre-fire stand conditions affect the suitability of post-fire habitat for the species, and because a substantial proportion of California's Black-backed Woodpeckers nest and forage at a low population density in unburned forests. Conserving the Black-backed Woodpecker in California likely requires appropriate management and stewardship of the habitat where this species reaches its highest density – recently burned forest – as well as appropriate management of 'green' forests that have not burned recently.

In the nearby Blue Mountains of Eastern Oregon (Bull et al. 1986, Nielsen-Pincus 2005), it was found that grand fir cover types were used approximately 27% of the time for nesting in Bull's 1970s study and 14% of the time in Nielsen-Pincus's study of the same general area in 2003-2004.

The emphasis on stand thinning and salvage of dying trees is of a concern for the black-backed woodpecker (Hutto 2008, Dudley et al. 2012, and Tingley et al. 2014).

The viability of the black-backed woodpecker is threatened by fire suppression, "restoration" logging and "forest resilience" policies which specifically attempt to prevent its habitat from developing. "Insect infestations and recent wildfire provide key nesting and foraging habitats" for the black-backed woodpecker and "populations are eruptive in response to these occurrences" (Wisdom et al. 2000). A basic purpose of the agency's management strategies are to negate the natural processes that the black-backed woodpecker biologically relies on; the emphasis in reducing the risk of stand loss due to stand density coupled with the increased risk of stand replacement fire events. Viability of a species cannot be assured, if habitat suppression is a forestwide policy.

We incorporate our discussion on the black-backed woodpecker from our comments on the Draft Forest Plan and EIS (pp. 243-249).

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies identified above.

FIRE ECOLOGY AND WILDLAND URBAN INTERFACES

On pages 1-2 of our comment, we raised the issue with the legitimacy of the project for which the Forest Service was using its authority under the Farm Bill. Part of what we discussed includes the following:

> The PA admits only half of the area is within the WUI in Benewah and Latah Counties. There is not map showing where this is located in the PA and whether the units are within the WUI. Regardless, the WUI decision did not go through NEPA and is not based upon the best available science (see Cohen, Jack D., *Reducing the Wildland Fire Threat to Homes: Where and How Much?,* USDA Forest Service Gen. Tech Report PSW-GTR-173, p. 192 (1999) which notes

anything beyond 100 meters of structures is ineffective). In essence, the WUI is about 100 meters wide, according to the agency's own researcher.

The EA did not address this comment at all, and it should be addressed because the best thing homeowners can do to protect their property and structures is to create defensible space. Cohen points out that "[t]he home and its surrounding 40 meters determine home ignitability, home ignitions depend on home ignitability, and fire losses depend on home ignitions...Because home ignitions depend on home ignitability, the behavior of wildland fires beyond the home or community site does not necessarily correspond to W-UI home fire loss potential. Homes with low ignitability can survive high-intensity wildland fires, whereas highly ignitable homes can be destroyed during lower-intensity fires" Cohen 2000. "Fuel reduction also has been overpromised to be effective, using questionable logic and unvalidated models." DellaSala et al. 2015, Ch. 13, p. 383 in The Ecological Importance of Mixed Severity Fires: Nature's Phoenix (and see entire chapter generally).

The definition of WUI is also partly based on "recommendations to the Secretary in a community wildfire protection plan." Our understanding is that community wildfire protection plans are written by folks such as county employees, outside of any public process such as NEPA. However well-meaning those planners might be, they are not accountable to the owners of these **national** forests. The WUI must be established in the context of NEPA, and therefore be subject to the test of good science and full and fair analysis, unlike the present delineations. If the Forest Service is going to rely on county wildfire plans to justify a project, this wildfire plan must be reviewed under the National Environmental Policy Act and subject to the best available science. Here, we couldn't find a Latah County Wildfire Protection Plan in the project record the Forest Service posted to its project website, only the King and Bloch 2011 "Multi-Hazard Mitigation Plan." In any event, many of these wildfire protection plans predate several studies from above that suggests, that fuels-reduction can exacerbate fire severity. And King and Bloch 2011 does not mention Cohen's science about defensible space. "Only treating fuels in the immediate vicinity of the homes themselves can reduce risk to homes, not backcountry fuel reductions projects that divert scarce resources away from true home protection." DellaSala et al. 2015 (Chapter 13), p. 384 (citing Cohen, 2000; Gibbons et al. 2012; Calkin et al. 2013; Syphard et al, 2014). We've provided these additional citations, which include the Forest Service's own experts.

The longer explanations about fuels in the EA, which weren't available at scoping, are scientifically controversial as discussed below. The Forest Service will find that the best available science throws into controversy the assumption that logging will reduce fire risk. For this reason, it is highly doubtful that this project will achieve the agency's "fuel" related aims. Because science suggests that the Forest Service may be increasing fire risk, an EIS must be conducted should the Forest Service choose not to withdraw this project.

Fire severity is not greater where fire has been absent. Odion et al. 2004 found "three times more high-severity fire in areas last burned since 1920 (recently burned landscape). The amount of high-severity fire in all areas previously burned in 1920 or earlier (long-unburned landscape)." Instead of reducing fire, logging can increase the probability of fire where it might not have otherwise burned, which is a concept the Forest Service must recognize in the face of the best available science. Even-aged silviculture practices can increase fire hazard, and that is primarily what is proposed with this project. Odion et al. 2004 found that "tree plantations had twice the burn severity of closed-canopy forests." Please also review Bradley et al. 2016, which found that burn severity tended to be higher in areas with less protection status, i.e., increased vegetation "management" authorized by the Forest Service. Areas more protected from logging had lesser high-severity fires. Zald & Dunn 2018 found that plantation forestry with young forests and spatially homogenized fuels were more significant in predicting wildfire severity than pre-fire biomass. And Lesmeister, et al., 2019 discusses the positive role that old-growth ("untreated" old growth) plays in countering impacts from high-severity fires--protecting these areas are the solution, not the problem to be logged. All of this science suggests that if there is any change in the frequency of fire-severity on the landscape, it is likely due to the Forest Service's own silvicultural practices. And for proposed "fuel treatments" in old growth, the above science strongly suggests that this isn't necessary—the Forest Service hasn't cited contrary evidence, so the origin of this assumption is unclear.

Westerling et al. 2006 stated that fires in this region, the Northern Rockies, has not been impacted from previous land-use effects; the ecosystem feature of stand-replacing fire is part of the reason why fire suppression has had minimal impact on the fire regime in the Northern Rockies. *See* Westerling et al. 2006. Noss et al. 2006 agrees that fire suppression has very likely not impacted the historical variability of fires in the Northern Rockies. The Forest Service must acknowledge this science and discuss that in relation to the agency's assertion that fire suppression leads to and has caused high-severity fires. Wildfire suppression has little impacted this region because the natural range of variability includes high-severity fires on the order of centuries. *See, e.g.*, Brunelle and Whitlock 2003; Westerling et al. 2006; Eaton 2017.

Fuel treatments are unlikely to be effective. Rhodes & Baker studied fire records and found that, over the 20-year period that fuel reduction is assumed to be effective, approximate 2.0-4.2% of untreated areas would be expected to burn at high or high-moderate severity. Rhodes & Baker 2008. This, considered with the science above, renders the Forest Service's assumption that logging can satisfy the fuel-reduction purpose and need or that logging won't make a fire risk worse controversial at best.

Temperate wet forests in the Pacific Northwest have not been vulnerable to prehistoric human activities. Additionally, the Forest Service does a disservice to the role and value that Douglas-fir plays in our forest, especially as it pertains to the natural fire regimes. We discuss this more in the vegetation section, but the Forest Service must recognize that, in part because Douglas-fir has coevolved with fire in this region, that it has been a naturally occurring tree well before the Forest Service started logging in the Nez Perce-Clearwater National Forests. "This conifer has evolved with fire and displays several life-history traits that allow it to persist across a wide range of fire frequencies and severities (Tepley et al., 2013)." Whitlock 2015, p. 273. (Studies from the western side of the Pacific Northwest are informative for the Clearwater Basin because of the comparative phylogeography. *See* Brunsfeld et al. 2001.) Additionally, Odion et al. 2014 noted that in the Northern Rockies, FIA plots in areas protected from logging showed a majority of plots where Douglas-fir was the dominant overstory tree.

Mixed severity fire is important. Mixed severity fire, which includes patches of natural high-severity fire, *creates* biological diversity in this region, and wildlife rely on it. When we discuss high-intensity fire, we mean stands with over 75 percent tree mortality. High-severity fire is ecologically important, too. *See* Bond et al. 2012. Snag forest habitat "is one of the most ecologically important and biodiverse forest habitat types in western U.S. conifer forests (Lindenmayer and Franklin 2002, Noss et al. 2006, Hutto 2008)." Hanson 2010. "Many plant and animal species are adapted to post-fire conditions, and populations of some (eg many bird species; Figure 1) decline after fire exclusion or post-fire logging." Noss et al. 2006. Hutto 2008 found that the black-backed woodpecker is a specialized species on severely burned forests. Hutto found a distribution of black-backed woodpeckers, which "suggests that conditions created by severe fires probably represent the historical backdrop against which this species evolved." And, "[t]he desire to rid our forests of severe fire beyond the urban interface is, for many forest types, not well grounded in ecological science." Hutto 2008. Please also see LeQuire 2009 and Odion et al. 2014.

Trees impacted by fire, windthrow, or other natural disturbance regime (like insects and disease) have an ecological role to play. Tree death is a natural process (Franklin et al. 1987) and eliminating trees that you call "damaged" impacts the natural process going forward. In the wildlife report the Forest Service noted that it expected use of the project area by the black-backed woodpecker to be low because of "insufficient areas of snags clustered at densities required for nest sites." Now the Forest Service alleges conditions on the forest (root disease and possible future insects) that can kill trees and create the very habitat that the agency notes is lacking for the black-backed woodpecker, yet this project aims to eliminate that possibility.

Another concept ignored, which we would have presented in scoping if this project had been initially scoped under NEPA and not the more limited HFRA/Farm Bill is the concept of fire refugia, and the EA must account for eliminating fire refugia with this project. *See* Krawchuk et al. 2016, and Zimmer 2018. The term "fire refugia" focuses "on the idea of locations disturbed less frequently or less severely by wildfire relative to the surrounding vegetation matrix. Fire refugia provide habitat for individuals or populations in which they can survive fire, in which they can persist in the postfire environment, and from which they can disperse into the higher-severity landscape." Meddens et al. 2018. Sometimes refugia can be forecasted, but sometimes these areas survive by happenstance. Zimmer 2018 and Krawchuck et al. 2016. The Forest Service ignores the likelihood that the more acreage it "treats" by trying to burn or log, the more likely the agency will eliminate what might have served as fire refugia. These islands provide pockets of shelter for animals, and they disperse seeds to burned areas. *See* Zimmer 2018. The agency needs to discuss the importance of fire refugia and analyze the impact of logging. Has the forest service ever tried to map out refugia? Has the Forest Service ever recognized that that if an area is long-unburned, it might have potential to serve as a fire refugia?

The fuels models used by the Forest Service is scientifically questionable. The Forest Service used BEHAVE PLUS 6 to predict fire and model fuel, from which the Forest Service predicted post-treatment conditions. However, many of these fire and fuel models are ones the scientific community recognizes to be flawed because they have an underprediction bias and have not been validated:

> The underprediction bias means that these models often predict that fuel reductions would reduce or eliminate the potential for crown fires in forests, when in fact fuel reductions do not achieve this effect. Fixing these models would be difficult and has not yet occurred (Alexander and Cruz, 2013). Also, these models have not been sufficiently tested and validated using a suite of actual fires, in which case they would likely be shown to fail (Cruz and Alexander, 2010). Alternative validated models are available and could be further developed, but they are not being used (Cruz and Alexander, 2010). Further, studies of tree mortality in thinned areas following fire do not typically take into account the mortality caused by the logging itself before the fire, leading to further biased results.
>
> These concerns should raise red flags about the effectiveness of fuel treatments, as well as issues regarding liability and responsibility...There are sound scientific reasons to closely scrutinize government wildland fuel0reduction programs. Meanwhile, we need to be honest and warn the public that living within or adjacent to natural forests prone to burn is inherently dangerous. Only treating fuels in the immediate vicinity of the homes themselves can reduce risk to homes, not backcountry fuel reductions projects that divert scarce resources away from true home protection (Cohen, 2000; Gibbons et al. 2012; Calkin et al. 2013; Syphard et al, 2014).

DellaSala et al. 2015 (Chapter 13), p. 384. There doesn't appear to be any discussion as to whether the Forest Service has validated the model it uses and what the results were.

The EA completely omitted any discussion around well-documented uncertainty of the strategy of logging to reduce future fire behavior, especially regeneration logging of mature forests, which could serve as fire refugia. It is increasingly understood and accepted that reducing fuels does not consistently prevent large fires and does not reduce the outcome of these fires. *See* Lydersen et al. 2014. Because there is scientific controversy surrounding this issue, the FS must prepare an EIS. Additionally, the Forest Service has a bias when discussing the no-action alternative that presumes severe fire will impact the exact areas logged within the 20 years that fuel reduction would be effective; this is roughly a 2-5 percent probability. *See* Rhodes and Baker 2008. **So, there is over a 90 percent chance that fuel reduction will not influence a fire's behavior.** In order for an honest, high-quality discussion, the no-action alternative needs to recognize the actual probability of high-severity wildfire for the length of time fuels reduction would be effective, and the no-action alternative must discuss the benefits of high-severity wildfire and its role in this region. *See* Hanson 2010 (and above discussion on mixed severity fire). For all the above reasons, the EA is deficient, the Forest Service has not disclosed the appropriate level of high-quality information to the public, and an environmental impact statement must be prepared.

Remedies:
1) Withdraw this project; or
2) Prepare an environmental impact statement addressing the issues discussed above and providing the public with high-quality information.

OLD GROWTH AND ASSOCIATED SPECIES

Our October 29, 2018 comments (pp. 3-4) and our January 7, 2019 comments (p. 2) raise the issue of old growth.

Old growth is important for several reasons. For one, citizens enjoy visiting these groves, for the mystery it invokes:

> The birth of "old growth" as the iconic forest can be encapsulated in a few words describing social meanings, time and space: re-enchantment trumped rationality; the eternal present absorbed the chronology of forest growth; mystical places colonized the choreography of sustained yield operations.

(Lee, 2009.) That opportunity doesn't exist in logging plantations, even if some of the larger, older trees are retained. We find nothing in the FS's perspective on old growth that recognizes these societal values.

Another reason old growth is important is for its rare habitat contribution for wildlife, plants, fungi and other life forms which are not well-represented in younger or managed forests. Simply put, they are reserves of biological diversity that are typically depleted by intensive management activities. The FS included old-growth management direction in the Forest Plan for the Clearwater National Forest because this type of habitat "is vital to the perpetuation of old-growth dependent species of wildlife." Appendix H.

Both the Clearwater Forest Plan and science recognize old growth is not simply large, healthy trees. As discussed in Franklin et al.'s 1987 article about tree death, forest health and resiliency does not mean an absence of fire, insects and disease. Fire, insect, and disease over a long period of time are exactly the processes that develop old growth. Old growth exists not merely for large, old, healthy trees—it exists precisely for the wildlife that need the decaying living trees in which to nest or den, the snags, and the logs on the ground which some of that wildlife den or forage for food. The logging project is designed to prevent or reduce heart rot, stand decadence, canopy closure, shrub-sapling layer, overall canopy closure, and coarse woody debris.

Scientific information and previous agency analysis on the old-growth associated wildlife indicate that logging would eliminate or reduce the characteristics that this wildlife needs, such as future snag recruitment, live trees that show signs of decadence, and the opening of canopies.

The White Pine EA fails to properly analyze the topic of old growth in the context of Forest Plan requirements. It basically says, we're slicing roads through old growth but don't worry—the degradation thus brought is not significant. Again, this says nothing about the existing conditions. The amount and distribution of old growth in the analysis area is not disclosed in the EA. The EA does not disclose population numbers, trends and distribution of old-growth associated species, including Management Indicator Species (MIS). The EA's analysis doesn't satisfy requirements of NEPA or NFMA.

Forest Plan Wildlife and Fish Standard 5.d(1) requires the FS to "Provide for old-growth dependent wildlife species by …Maintaining at least 10 percent of the Forest (including Selway-Bitterroot Wilderness) in old-growth habitat." The EA fails to demonstrate the FS is managing consistent with this forestwide 10% standard.

Forest Plan Wildlife and Fish Standard 5.d(2) requires the FS to "Provide for old-growth dependent wildlife species by …(s)electing at least 5 percent of each approximate 10,000 acre watershed (timber compartment) or combination of smaller watersheds (subcompartments) within forested nonwilderness areas to manage as old-growth habitat." The EA does not disclose if project area Old Growth Analysis Units (OGAUs) meet or fall below this standard. The EA also fails to disclose how well existing old growth is distributed among the CNF OGAUs.

The EA states, "The majority of the project area is identified in the Forest Plan as Management Area E-1…" Forest Plan Timber Standard 4(c) for Management Area E-1 requires the FS to: "Identify and maintain suitable old-growth stands and replacement habitats for snag and old-growth dependent wildlife species…" The EA fails to demonstrate consistency with this standard.

The Vegetation Resource Report from the project website states:

> Old growth direction in the Clearwater National Forest Plan states: provide for old-growth dependent wildlife species by maintaining at least 10 percent of the Forest in old growth habitat, and selecting at least 5 percent of each approximate 10,000 acre watershed within forested non-wilderness areas to manage as old-growth habitat (Forest Plan, II-23). Current Forest direction is to defer regeneration harvest in forested areas that are currently identified as old growth or that are within 20 years of meeting the minimum old growth criteria, referred to as "step down." These stands are retained to contribute to future old growth habitat.

There are 80 total acres of existing old growth in OGAUs, according to "OLD GROWTH SUMMARY" from project website. This is apparently based upon FS field surveys. However "K-0007_20190604_WhitePineAnalysis" (also from project website) claims there are 497 acres of existing old growth. These same numbers are repeated in the Vegetation Resource Report document (project website). The very existence of this discrepancy needs to be explained in a NEPA document. Instead, the EA just incorporates the analysis in the documents in the project file as its own. So the EA inherits and incorporates confusing, incomplete, and conflicting information.

The EA discloses project-inflicted damage and loss of old growth and "step down" old growth:

> The proposed permanent road accessing Units 46 to 50 will go existing and step down old growth. The road will be an approximate width of 20 feet. This action will result in a loss of approximately 0.2 acres of existing old growth and 0.3 acres of

> step down. Terrain limits the roads location and there is no way to avoid going through old growth.[12]
>
> The proposed temporary road accessing Units 51 and 52 will go through step down and recruitment old growth. The road will be an approximate width of 14 feet. This action will result in a loss of approximately 0.6 acres of step down old growth and 0.3 acres of recruitment. Terrain limits the roads location to the ridge top and there is no way to avoid going through old growth.[13]

Reducing old growth violates earlier Forest Service directives, such as the 2006 Reilly memo, as well as the Settlement Agreement. In a letter dated 10/8/93, Clearwater Forest Supervisor James Caswell indicated that the Forest Plan appeal Settlement Agreement "commits the Forest Service to prepare EISs for new roads and timber sale projects which directly affect 'verified' old-growth stands 100 acres or larger."

The Vegetation Resource Report states, "…with the addition of step down, both OGAU's are expected to reach five percent in the near future. Additional recruitment acres have also been selected in the project area and are to remain, including the area identified in the White Pine Creek project." For the designation or protection of "step down" or "recruitment" old growth to have any meaning, it must be designated in a manner that takes into consideration how close to meeting the old-growth criteria the designated stands are. The juxtaposition of such stands with other stands of old growth (or of "step down" or "recruitment" old growth) would also be a key consideration, given the elevated biological value of larger, unbroken blocks of such habitat. The EA provides no such explanation or analysis.

Moreover, the FS apparently has no accounting device for "recruitment" or "step down" old growth. This means administrative commitments, spreadsheets, or GIS/spatial inventories. The FS sees it is free to identify whatever it wants to fit these categories, with ever changing designations at any time. As stated in The Ecology Center 9/2/1994 appeal of the White Pine Creek Timber Sale Finding of No Significant Impact and Environmental assessment:

> Since the designation of the Blakes Fork area as replacement old growth carries no administrative weight and encompasses stands with few old-growth characteristics, there is no reason to presume that such designation will actually lead to these stands evolving into old growth. It is clear that the replacement designation is merely a book-keeping device, and has no relevance to the Forest Plan requirements except to indicate that these stands may be good candidates for old-growth at some undefined point in the future. It is entirely conceivable that the Forest Service could come out with another EA in the same area with an entirely different set of replacement old growth designations, and propose to cut within the Blakes Fork area. Such a situation clearly does not provide for the habitat needs of old-growth dependent species as required by the Forest Plan.

[12] Actually, there is a way to avoid building a road through old growth—forgo logging the proposed units the road would access.
[13] Ibid.

That was 26 years ago, and now the FS persists with the same dubious policies. We incorporate into this objection that earlier appeal as well as a subsequent appeal of the White Pine Creek Timber Sale submitted by FOC, AWR and others dated 9/24/1997, along with related public submissions—all contained in an electronic folder entitled "White Pine I".

Furthermore, the NPCNF lacks any established way of maintaining a publicly accessible inventory of old growth, let alone "step down" and "recruitment" old growth. The latter two categories need only meet very lax criteria, and as far as we're aware, in the 33 years of Forest Plan implementation there's no documentation of the FS ever designating "step down" or "recruitment" old growth which has eventually/later fully met existing old growth criteria. These lesser categories are an empty promise to the public, to associated wildlife, and other old-growth values.

So we now have "Fuels unit"[14] F01 and "regeneration harvest" units T06 and T07 which fall partially or totally within an area identified as "Stands within NEPA Designated Old Growth and Replacement Old Growth" in the White Pine Creek Timber Sale Record of Decision (ROD) as displayed on a map at ROD-29. This is also possibly the case with "regeneration harvest" units T20, T23, and T48, and even others. The lack of continuity and consistency of old growth identification is of great concern, invokes deep public distrust, and violates law, policy, and regulation. The White Pine ROD and accompanying Final EIS is also contained in the electronic folder entitled "White Pine I".

And the question is begged: What does this "step down" and "unverified" old growth really look like, to wildlife species finding optimum conditions in old growth?

It also cannot be discerned if the stands are meeting the optimal 80-acre or minimal 25-acre stand size requirement for old growth. And the FIA data the FS relies upon to estimate old growth, in its dry statistical nature, utterly fails to provide any information on such stand size requirements, or any spatial information whatsoever. These, and other problems deny the public high quality information and don't show that the FS has taken a hard look at impacts or cumulative impacts. This also violates NFMA because the FS cannot demonstrate compliance with the forest plan, especially since the agency has not been meeting old-growth standards on this forest and has increased logging in recent years. See Reilly memo, USDA (2006) and R1 Timber sold annual reports as displayed in our Draft Revised Forest Plan comments.

USDA Forest Service 1987a acknowledges smaller patches of old growth are of lesser value for old-growth associated wildlife:

> A unit of 1000 acres would probably meet the needs of all old growth related species (Munther, et al., 1978) but does not represent a realistic size unit in conjunction with most other forest management activities. On the other hand, units of 50-100 acres are the smallest acceptable size in view of the nesting needs of pileated woodpeckers, a primary cavity excavator and an old growth related

[14] The EA states, "non-commercial fuels treatments may be accomplished using a combination of handwork, chainsaw work, or machine work, depending on slope, vegetative conditions, and fuel characteristics."

> species (McClelland, 1979). However, **managing for a minimum size of 50 acres will preclude the existence of species which have larger territory requirements.** In fact, Munther, et al. (1978), report that **units of 80 acres will meet the needs of only about 79 percent of the old growth dependent species** (see Figure 1). Therefore, while units of a minimum of 50 acres may be acceptable in some circumstances, 50 acres should be the exception rather than the rule. Efforts should be made to provide old growth habitat in **blocks of 100 acres or larger**. …Isolated blocks of old growth which are less than 50 acres and surrounded by young stands contribute very little to the long-term maintenance of most old growth dependent species. (Emphases added.)

This area is surrounded by state and private lands that focus on timber harvesting, so the FS has also violated NEPA by failing to consider the cumulative effects of the likely absolute lack of this habitat in the immediate vicinity other than what occurs on national forest land.

Our October 29, 2018 comments state:

> Additionally, the project as proposed appears to log the old-growth set aside to meet the Clearwater Forest Plan. If the Forest Service reviews the "Mature/Late Successional" map for Alternative G of the 1997 White Pine project Environmental Impact Statement (which was alternative selected in the previous project) and compares with the proposed action map for White Pine II (this project), there appears to be a problematic overlap. The Forest Service must analyze and assess this project for whether it meets old-growth standards.

The EA failed to examine this issue. It appears that the FS's old-growth allocations in any given area vary over time, but there's no explanation of what's going on. The FS actions appear arbitrary and capricious. It would be consistent with the FS's treatment of the subject of old growth (vague, confusing, disingenuous, and misleading) for the very best stands just short of meeting old growth criteria to be clearcut under the White Pine project. Large, old trees not within designated categories of old growth are not protected at all with the silvicultural prescriptions. There isn't even a simple diameter limit on trees to be logged.

Gautreaux, 1999 states:

> …research in Idaho (Lesica 1995) of stands in Fire Group 4, estimated that over 37% of the dry Douglas-fir type was in an old growth structural stage (>200 years) prior to European settlement, approximately the mid 1800's.
>
> Based on research of Fire Group 6 in northwest Montana (Lesica 1995) it was estimated that 34% of the moist Douglas-fir type was in an old growth structural stage (>200 yrs.) prior to European settlement, approximately the mid 1800's.
>
> Based on fire history research in Fire Group 11 for northern Idaho and western Montana (Lesica, 1995) it was estimated that an average of 26% of the grand fir,

> cedar, and hemlock cover types were in an old growth structural stage prior to European settlement.
>
> …fire history research in Fire Group 9 for northern Idaho and western Montana (Lesica, 1995) estimated that 19-37% of the moist lower subalpine cover types were in an old growth structural stage (trees > 200 yrs.) prior to European settlement. While this estimate is lower than suggested by Losensky's research…
>
> Lesica found an estimated 18% of the cool lodgepole pine sites was in an old growth structural stage (>200 years) prior to European settlement, approximately the mid 1800's. … This same research in Fire Group 8 in drier, lower subalpine types of Montana had over 25% of the stands in an old growth structural stage during the same historical period.

Also, Lesica (1996) states, "Results of this study and numerous fire-history studies suggest that old growth occupied 20-50% of many pre-settlement forest ecosystems in the Northern Rockies." (Emphasis added.) Lesica, 1996 (also cited in Gautreaux, 1999) stated forest plan standards of maintaining approximately 10% of forests as old-growth in the Northern Region may extirpate some species. This is based on his estimate that 20-50% of low and many mid-elevation forests were in old-growth condition prior to European settlement. This should be considered some of the best science on historic range of old growth necessary for insuring viability of old-growth associated species.

Regarding the FS is relying upon Forest Inventory and Analysis (FIA) data to determine forestwide amounts of old growth—and therefore Forest Plan consistency and viability assurance. There are significant methodological flaws with this approach, only one of those being that the FIA data do not determine the size of any particular old-growth stand.

The FS Region 1 report Bollenbacher, et al., 2009 states concerning the FIA inventory: "All northern Idaho plots utilized a primary sample unit (PSU) composed of four fixed radius plots with trees 5 – 20.9 inches tallied on a 1/24th acre plot and trees 21.0 inches DBH and larger tallied on a ¼ acre plot." Also, Czaplewski, 2004 states, "Each FIA sample location is currently a cluster of field sub-plots that collectively cover an area that is nominally one acre in size, and FIA measures a probability sub-sample of trees at each sub-plot within this cluster." In addition, Bollenbacher and Hahn, 2008 under "Defining Old Growth" state: "There are no specific criteria for minimum patch size for OG in the Northern Region definitions" but recognize "There are, however, some Forest Land Management Plans that may include guidance for a minimum map unit for OG stands." Bollenbacher and Hahn, 2008 try to make a case for smaller minimum stand sizes, saying "The regional vegetation minimum map unit of 5 acres for a stand polygon would be a reasonable lower limit for all vegetation classes of forest vegetation including OG stands." Clearly, whether the FS is using a ¼-acre, one-acre, or five-acre minimum map unit, none conform to the Forest Plan old-growth minimum stand size criteria. Furthermore, it would be ludicrous to propose that any old-growth associated MIS, Sensitive, or ESA-listed species could survive on even a five-acre old-growth stand—there is no scientific evidence to support such a premise. In sum, FIA data do not reliably measure **ecologically functioning** old growth.

The EA does not disclose how old the FIA data are, which the old-growth analysis (forestwide and project level) relies upon. It also does not indicate how many FIA plots fall within the project area or Forest, and how many of those are classified as old growth.

Regardless, old growth is well below HRV for the Forest and project area, so how viability for old-growth associated species can be assured while further depletion of habitat would occur goes without explanation.

The EA exaggerates the ecological value of trees that better resist insects and disease. From its timber-centric perspective, growing such trees is a major purpose claimed in the EA. Yet the EA does not reconcile such a position with the following best available science concerning forests:

> "(A)ttributes such as decadence, dead trees …are important…" (Green et al., 1992).
> "Accumulations of large-size dead standing and fallen trees that are high relative to earlier stages." (Id.)
> "Decadence in the form of broken or deformed tops or bole and root decay." (Id.)

Green et al., 1992 describe Defining characteristics of old growth, which include:

> Old growth forests encompass the late stages of stand development and are distinguished by old trees and related structural attributes. These attributes, such as tree size, canopy layers, snags, and down trees generally define forests that are in and old growth condition.
>
> Definition
> Old growth forests are ecosystems distinguished by old trees and related structural attributes. Old growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics which may include tree size, accumulations of large dead woody material, number of canopy layers, species composition, and ecosystem function.
>
> (O)ld growth is typically distinguished from younger growth by several of the following attributes:
> 1. Large trees for species and site.
> 2. Wide variation in tree sizes and spacing.
> 3. Accumulations of large-size dead standing and fallen trees that are high relative to earlier stages.
> 4. Decadence in the form of broken or deformed tops or bole and root decay.
> 5. Multiple canopy layers
> 6. Canopy gaps and understory patchiness.

The Kootenai National Forest 1987 Forest Plan included Appendix 17 and other direction (USDA Forest Service 1987a). We incorporate that appendix as well as USDA Forest Service 1987b which contains a list of "species …(which) find optimum habitat in the "old" successional stage…" And Kootenai National Forest, 1991 states that "we've recognized its (old growth) importance for vegetative diversity and the maintenance of some wildlife species that depend on it for all or part of their habitat." (Also see USDA Forest Service, 1990a.) We also incorporate the Idaho Panhandle NF's forestwide old-growth planning document (USDA Forest Service, 1987d) and the IPNF Forest Plan's old-growth standards (USDA Forest Service, 1987c) because they provide biological information concerning old growth and old-growth associated wildlife species.

USDA Forest Service, 1987a states:

> Richness in habitat translates into richness in wildlife. Roughly 58 wildlife species on the Kootenai (about 20 percent of the total) find optimum breeding or feeding conditions in the "old" successional stage, while other species select old growth stands to meet specific needs (e.g., thermal cover). Of this total, five species are believed to have a strong preference for old growth and may even be dependent upon it for their long-term survival (see Appendix I[15]). While individual members or old growth associated species may be able to feed or reproduce outside of old growth stands, biologists are concerned that viable populations of these species may not be maintained without an adequate amount of old growth habitat.
>
> Wildlife richness is only a part of the story. Floral species richness is also high, particularly for arboreal lichens, saprophytes, and various forms of fungus and rots. Old growth stands are genetic reservoirs for some of these species, the value of which has probably yet to be determined.

The EA also does not properly analyze and disclose the natural historic range vs. current conditions regarding patch size, edge effect, and amount of interior forest old growth in the Clearwater NF. Harris, 1984 discusses connectivity and effective interior habitat of old-growth patches:

> Three factors that determine the effective size of an old-growth habitat island are (1) actual size; (2) distance from a similar old-growth island; and (3) degree of habitat difference of the intervening matrix. …(I)n order to achieve the same effective island size a stand of old-growth habitat that is surrounded by clearcut and regeneration stands should be perhaps ten times as large as an old-growth habitat island surrounded by a buffer zone of mature timber.

Harris, 1984 discusses habitat effectiveness of fragmented old growth:

> (A) 200-acre (80 ha) circular old-growth stand would consist of nearly 75% buffer area and only 25% equilibrium area. …A circular stand would need to be about 7,000 acres (2,850 ha) in order to reduce the 600-foot buffer strip to 10% of the total area. It is important to note, however, that the surrounding buffer stand does not have to be old growth, but only tall enough and dense enough to prevent wind and light from entering below the canopy of the old-growth stand.

[15] USDA Forest Service 1987b.

Harris, 1984 believes that "biotic diversity will be maintained on public forest lands only if conservation planning is integrated with development planning; and site-specific protection areas must be designed so they function as an integrated landscape system." Harris, 1984 also states:

> Because of our lack of knowledge about intricate old-growth ecosystem relations (see Franklin et al. 1981), and the notion that oceanic island never achieve the same level of richness as continental shelf islands, a major commitment must be made to set aside representative old-growth ecosystems. This is further justified because of the lack of sufficient acreage in the 100- to 200-year age class to serve as replacement islands in the immediate future. …(A) way to moderate both the demands for and the stresses placed upon the old-growth ecosystem, and to enhance each island's effective area is to surround each with a long-rotation management area.

The FS has conducted no research or monitoring comparing pre- and post-logging old growth occupancy by or abundance of the wildlife species with strong biological association with habitat components found in old growth, to see if logged old growth is still functioning as effective or suitable habitat.

USDA Forest Service, 2004a states:

> Harvest or burning in stands immediately adjacent to old growth mostly has negative effects on old growth, but may have some positive effects. Harvesting or burning adjacent to old growth can remove the edge buffer, reducing the effective size of old growth stands by altering interior habitats (Russell and Jones 2001). Weather-related effects have been found to penetrate over 165 feet into a stand; the invasion of exotic plants and penetration by predators and nest parasites may extend 1500 feet or more (Lidicker and Koenig 1996). On the other hand, adjacent management can accelerate regeneration and sometimes increase the diversity of future buffering canopy.
>
> The occurrence of roads can cause substantial edge effects on forested stands, sometimes more than the harvest areas they access (Reed, et al. 1996; Bate and Wisdom, in prep.). Open roads expose many important wildlife habitat features in old growth and other forested stands to losses through firewood gathering and increased fire risk.
>
> Effects of disturbance also vary at the landscape level. Conversion from one stand condition to another can be detrimental to some old growth associated species if amounts of their preferred habitat are at or near threshold levels or dominated by linear patch shapes and limited interconnectedness (Keller and Anderson 1992). Reducing the block sizes of many later-seral/structural stage patches can further fragment existing and future old growth habitat (Richards et al. 2002). Depending on landscape position and extent, harvest or fire can remove forested cover that provides habitat linkages that appear to be "key components in metapopulation functioning" for numerous species (Lidicker and Koenig 1996, Witmer et al. 1998).

> Harvest or underburning of some late and mid seral/structural stage stands could accelerate the eventual creation of old growth in some areas (Camp, et al. 1996). The benefit of this approach depends on the degree of risk from natural disturbances if left untreated.
>
> Effects on old growth habitat and old growth associated species relate directly to … "Landscape dynamics—Connectivity"; and … "Landscape dynamics—Seral/structural stage patch size and shapes."

The FS utilizes its Green et al. 1992 document inappropriately, in that it was never intended to set old-growth criteria. The numbers were intended to be minimum screening criteria for possible old growth stands from the timber stand data base. According to the Green et al. 1992 the final determination of old growth status was to be made by a qualified ecologist or wildlife biologist. Further explanation is in USDA Forest Service, 1990a. Strict reliance on data base queries from the timber stand database has been shown to give unreliable results (Iron Honey Timber Sale, Idaho Panhandle National Forests – 9th Circuit Court of Appeals, 2004) and is no substitute for field investigation by qualified professionals.

Green et al. 1992 arrived after the Forest Plan was adopted. In preparing and adopting these old growth guidelines, the FS did not use an independent scientific peer review process, as discussed by Yanishevsky, 1994:

> As a result of Washington Office directives, Region 1 established an Old-Growth Committee. In April 1992, Region 1 issued a document entitled "Old-Growth Forest Types of the Northern Region," which presented Old-Growth Screening Criteria for specific zones on Western Montana, Eastern Montana, and North Idaho (U.S.D.A. Forest Service 1992). This was an attempt to standardize criteria for classifying the variety of old-growth types across the Region. …The committee, however, executed this task without the benefit of outside scientific peer review or public input, either during or after the process (Yanishevsky 1990, Shultz 1992b). Moreover, the methodology used by the committee was unscientific and did not even include gathering field data to verify the characteristics of old-growth stands as a basis for the definition (*id.*).
>
> A former member of the Region 1 Old-Growth Committee described a "definition process" that relied heavily upon the Committee members' pre-conceived notions of the quantifiable characteristics of old-growth forests (Schultz 1992b).
>
>> The old-growth definition in its present state, without field verification of assumptions, and without addressing the issue of quality, is inadequate to scientifically describe, define, delineate, or inventory old-growth ecosystems.
>
> (*id.*) Not only did the Committee fail to obtain new field data on old-growth forest characteristics, it failed even to use existing field data on old-growth definition and classification previously collected for Region 1 (Pfister 1987). Quality of old

> growth was not addressed during the definition process. The Committee did not take into account the legacy of logging that has already destroyed much of the best old growth. This approach skewed the characteristics that describe old-growth forests toward poorer remaining examples. …It is premature for the Forest Service to base management decisions with long-term environmental effects on its Region 1 old-growth criteria, until these criteria are validated by the larger scientific community.

Yanishevsky (1994) also pointed out the inadequacy of maintaining merely "minimum" amounts of habitat such as snags and old growth.

Pfister et al., 2000 state:

> (T)here is the question of the appropriateness of management manipulation of old-growth stands… Opinions of well-qualified experts vary in this regard. As long term results from active management lie in the future – likely quite far in the future – considering such manipulation as appropriate and relatively certain to yield anticipated results is an informed guess at best and, therefore, encompasses some unknown level of risk. **In other words, producing "old-growth" habitat through active management is an untested hypothesis.** (Emphasis added).

The FS has also not complied with forest plan requirements for monitoring population trends of it old-growth Management Indicator Species (MIS). MIS population trend monitoring is an important mechanism upon which the FS's forest plan management assumptions rely upon to insure old-growth associated wildlife viability. Without such trend data, the FS is unable to apply "adaptive management" to change its management of the forest plan habitat standards turn out to be insufficient for maintaining viability. It also is unable to provide an adequate cumulative effects analysis.

The Committee of Scientists (1999) state, "The presence of suitable habitat does not ensure that any particular species will be present or will reproduce. Therefore, **populations of species must also be assessed and continually monitored**." (Emphasis added.)

Furthermore, the FS cannot even cite any scientific information that shows 10% old growth forestwide is within reference conditions, otherwise known as within the "historic range of variability" (HRV). This fact makes it all the more important to monitor population trends.

The FS has also failed to provide adequate protection for designated old growth, resulting in a widespread loss of vital old-growth snag component due to firewood cutting and other activities adjacent to open roads. (*See* Bate and Wisdom, 2004.)

Finally, we incorporate our comments on the Draft Revised Forest Plan and Draft EIS (specifically our comments discussing old growth on pp. 134-156) within these comments.

Remedy:
1) Choose the no-action alternative;

2) Withdraw the project;
3) Address the issues above and provide another comment period so members of the public are fully informed and evidence exists to support the conclusions the FS reached.

PILEATED WOODPECKER

Our October 29, 2018 comments raise the issue of old-growth associated wildlife species (p. 3).

We incorporate our discussion on the pileated woodpecker from our comments on the Draft Forest Plan and EIS (pp. 239-243).

The pileated woodpecker is a Clearwater National Forest management indicator species (MIS) for old-growth forest and large snag habitat.

The White Pine EA does not mention pileated woodpeckers. In fact, it fails to discuss the concept of MIS in any way, including how population trend monitoring was a mechanism with which the FS was to assure viability of native wildlife species. The Forest Plan declares MIS are "used to monitor the effects of planned management activities on viable populations of wildlife and fish…". And after all, Forest Plan Goal 5.a. (Wildlife) is "Provide habitat for viable populations of all indigenous wildlife species." And Forest Plan assumption is, "The benchmark analysis indicated that old-growth stands exist in quantities sufficient to maintain viable populations of old-growth dependent wildlife species in each decade of the planning horizon." The EA ignores the fact that the FS has not monitored the population trends of its MIS as required by the Clearwater Forest Plan, thus neglecting to follow basic adaptive management principles as well as Forest Plan requirements. The Forest Plan requires the FS to monitor "Population Trends of Indicator Species", reporting at least every five years.

The NPCNF's Lolo Insect & Disease FEIS describes pileated woodpecker habitat:

> Pileated woodpeckers are large, cavity-nesting birds associated with late successional stage forests, but also may use younger forests that have scattered, large, dead trees (Bull and Jackson, 1995). The woodpecker appears to seek out microhabitats with a higher diversity of tree species and higher densities of decadent trees and snags than are available across a landscape (Savignac et al, 2000; Aubry and Raley, 2002). Through their selection of large dead and damaged trees, the bird may serve as a good indicator of ecological function rather than just the age of a stand or forest (Bonar, 2001).

We can't help but notice that the above habitat characteristics are the kind of features that the White Pine Project is managing to suppress or prevent from developing.

There is no analysis in the EA that discloses the geographic and temporal cumulative effects of the FS's overall management strategy (basically tree farming) which attempts to suppress the natural processes creating decadent trees, snags which the pileated woodpecker relies upon. There is no reliable, up-to-date forestwide analysis of habitat, and forestwide population trends have not been monitored.

The Wildlife Report notes, "The Forest Plan specifically sets forth criteria for pileated woodpeckers: 'In each 10,000 acres of suitable habitat, a 300 acre stand should be managed as old growth for pileated woodpeckers…it is acceptable to divide the 300 acres into not more than three 100 acre areas as long as the areas are within 2 square miles… The 100+ acre stands should be wider than 200 yards at any one point.'" Nothing in the EA or Wildlife Report demonstrated the project area is being managed consistently with this forest plan requirement.

The Ninth Circuit has stated the FS "must both describe the quantity and quality of habitat that is necessary to sustain the viability of the species in question and explain its methodology for measuring this habitat." (*Lands Council v. McNair*).

The Wildlife Report discloses:

> Disturbance from noise, human presence or equipment during Project activities could displace woodpeckers during the nesting season or deter use of nesting, foraging, or roosting areas. Timber harvest has been shown to reduce reproductive success of pileated woodpeckers (Bull et al. 2007). Equipment use could result in individual injury or mortality if a nesting tree is felled while in use.
>
> **Qualitative** indirect effects of Alternative 2 include the reduction of pileated woodpecker habitat through regeneration harvest and the modification of habitat through fuel treatments. Treatments designed to reduce forest insect and disease in turn reduces pileated woodpecker foraging habitat. (Emphasis added.)

The Wildlife Report indicates that clearcutting will destroy 14% of the nesting habitat in the project area, fuel treatments will impact another 10%. It also indicates that clearcutting will destroy 27% of the nesting habitat in the project area, fuel treatments will impact 11%, and commercial thinning 3%. There is no discussion of the loss of pileated habitat by new road building. Since neither the EA nor Wildlife Report include a cumulative effects analysis as required by NEPA, it is impossible to tell how much pileated woodpecker habitat has already been destroyed or degraded by logging, road building, and other management.

No estimates of snags for the project area are found in the EA or other analyses. All the Wildlife Report says is, "Snag habitat would be maintained at the Forest Plan standard for the project area and forest-wide." There's no analysis whatsoever—qualitative or quantitative, direct, indirect, or cumulative. So the FS has no idea if conditions in the project area are adequate for supporting reproducing populations of pileated woodpeckers or other snag- and down log-dependent wildlife.

The EA doesn't disclose a scientifically sound strategy to insure viable populations of the pileated woodpecker. Bull et al. 2007 represents over 30 years of investigation into the effects of logging on the pileated woodpecker and is recent research information on such effects, and contrast the effects of natural disturbance with large-scale logging on pileated woodpeckers. Also see Bull et al., 1992, Bull and Holthausen, 1993, and Bull et al., 1997 for biology of pileated woodpeckers and the habitats they share with cavity nesting wildlife.

The Idaho Panhandle NF's original Forest Plan old-growth standards (USDA Forest Service, 1987c) were largely built around the habitat needs of its indicator species, the pileated woodpecker. Very similar direction is found in the Clearwater Forest Plan, as cited above. Bull and Holthausen 1993, provide field tested management guidelines. They recommend that approximately 25% of the home range be old growth and 50% be mature forest.

USDA Forest Service, 1990 indicates measurements of the following variables are necessary to determine quality and suitability of pileated woodpecker habitat:

- Canopy cover in nesting stands
- Canopy cover in feeding stands
- Number of potential nesting trees >20" dbh per acre
- Number of potential nesting trees >30" dbh per acre
- Average DBH of potential nest trees larger than 20" dbh
- Number of potential feeding sites per acre
- Average diameter of potential feeding sites

USDA Forest Service, 1990 states, "To provide suitable pileated woodpecker habitat, strips should be at least 300 feet in width…"

This preferred diameter of nesting trees for the pileated woodpecker is notable. McClelland and McClelland (1999) found similar results in their study in northwest Montana, with the average nest tree being 73 cm. (almost 29") dbh. The pileated woodpecker's strong preference for trees of very large diameter is not adequately considered in the Forest Plan. The EA provides no firm numerical commitment for leaving specific numbers and sizes of largest trees favored by so many wildlife species.

B.R. McClelland extensively studied pileated woodpecker habitat needs. McClelland, 1985 states:

> Co-workers and I now have a record of more than 90 active pileated woodpecker nests and roosts, …the mean dbh of these trees is 30 inches… A few nests are in trees 20 inches or even smaller, but the <u>minimum</u> cannot be considered suitable in the long-term. Our only 2 samples of pileateds nesting in trees <20 inches dbh ended in nest failure… At the current time there are many 20 inch or smaller larch, yet few pileateds selected them. Pileateds select <u>old</u>/old growth because old/old growth provides habitat with a higher probability of successful nesting and long term survival. They are "programmed" to make that choice after centuries of evolving with old growth.

McClelland (1977), states:

> (The Pileated Woodpecker) is the most sensitive hole nester since it requires old growth larch, ponderosa pine, or black cottonwood for successful nesting. The Pileated can be considered as key to the welfare of most hole-nesting species. If

> suitable habitat for its perpetuation is provided, most other hole-nesting species will be accommodated.
>
> Pileated Woodpeckers use nest trees with the largest dbh: mean 32.5 inches;
>
> Pileated Woodpeckers use the tallest nest trees: mean 94.6 feet;
>
> The nest tree search image of the Pileated Woodpecker is a western larch, ponderosa pine, or black cottonwood snag with a broken top (status 2), greater than 24 inches dbh, taller than 60 feet (usually much taller), with bark missing on at least the upper half of the snag, heartwood substantially affected by Fomes laracis or Fomes pini decay, and within an old-growth stand with a basal area of at least 100 sq feet/acre, composed of large dbh classes.
>
> A cluster analysis based on a nine-dimensional ordination of nest tree traits and habitat traits revealed close association between Yellow-bellied Sapsuckers, Mountain Chickadees, and Red-breasted Nuthatches. These three species plus the Pileated Woodpecker and Hairy Woodpecker are relatively grouped by coincident occurrence in old growth. Tree Swallows, Black-capped Chickadees, and Common Flickers are separated from the above five species by their preference for more open areas and their frequent use of small dbh nest trees.
>
> (Most) species found optimum nesting habitat in stands with a major component of old growth, particularly larch. Mean basal area for pileated woodpecker nest sites was 150 square feet per acre. (McClelland. B.R. and others, 1979)
>
> Many large snags are being cut for firewood. Forest managers should limit firewood cutting to snags less than 15 inches in d.b.h. and discourage use of larch, ponderosa pine, and black cottonwood. Closure of logging roads may be necessary to save high-value snags. Logging slash can be made available for wood gatherers.

Recent scientific research reveals the inadequacy of the CNF's snag retention guidelines. For one example, Lorenz et al., 2015 state:

> Our findings suggest that higher densities of snags and other nest substrates should be provided for PCEs (primary cavity excavators) than generally recommended, because past research studies likely overestimated the abundance of suitable nest sites and underestimated the number of snags required to sustain PCE populations. Accordingly, the felling or removal of snags for any purpose, including commercial salvage logging and home firewood gathering, should not be permitted where conservation and management of PCEs or SCUs (secondary cavity users) is a concern (Scott 1978, Hutto 2006).

This means only the PCEs themselves (i.e., pileated woodpecker) have the ability to decide if a tree is suitable for excavating. This also means managers know little about how many snags per acre are needed to sustain populations of cavity nesting species. Lorenz et al., 2015 must be considered best available science to replace inadequate forest plan snag retention guidelines.

The FS's Vizcarra, 2017 notes that researchers "see the critical role that mixed-severity fires play in providing enough snags for cavity-dependent species. Low-severity prescribed fires often do not kill trees and create snags for the birds."

On the same subject, Hutto 2006, notes from the scientific literature: "The most valuable wildlife snags in green-tree forests are relatively large, as evidenced by the disproportionate number of cavities in larger snags (Lehmkuhl et al. 2003), and are relatively deteriorated (Drapeau et al. 2002)."

Spiering and Knight (2005) examined the relationship between cavity-nesting birds and snag density in managed ponderosa pine stands and examined if cavity-nesting bird use of snags as nest sites was related to the following snag characteristics (DBH, snag height, state of decay, percent bark cover, and the presence of broken top), and if evidence of foraging on snags was related to the following snag characteristics: tree species, DBH, and state of decay. These authors state:

> Many species of birds are dependent on snags for nest sites, including 85 species of cavity-nesting birds in North America (Scott et al. 1977). Therefore, information of how many and what types of snags are required by cavity-nesting bird species is critical for wildlife biologists, silviculturists, and forest managers.
>
> Researchers across many forest types have found that cavity-nesting birds utilize snags with large DBH and tall height for nest trees (Scott, 1978; Cunningham et al., 1980; Mannan et al., 1980; Raphael and White, 1984; Reynolds et al., 1985; Zarnowitz and Manuwal, 1985; Schreiber and deCalesta, 1992).

Spiering and Knight (2005) found the following.

> Larger DBH and greater snag height were positively associated with the presence of a cavity, and advanced stages of decay and the presence of a broken top were negatively associated with the presence of a cavity. Snags in larger DBH size classes had more evidence of foraging than expected based on abundance.
>
> Percent bark cover had little influence on the presence of a cavity. Therefore, larger and taller snags that are not heavily decayed are the most likely locations for cavity-nesting birds to excavate cavities.
>
> The association of larger DBH and greater height of snags with cavities is consistent with other studies (Scott, 1978; Cunningham et al., 1980; Mannan et al., 1980; Raphael and White, 1984; Reynolds et al., 1985; Zarnowitz and Manuwal, 1985; Schreiber and deCalesta, 1992).

Spiering and Knight (2005) state that the "lack of large snags for use as nest sites may be the main reason for the low densities of cavity-nesting birds found in managed stands on the Black Hills National Forest. ...The increased proportion of snags with evidence of foraging as DBH size class increased and the significant goodness-of-fit test indicate that large snags are the most important for foraging."

Dudley & Vallauri, 2004 state:

> Up to a third of European forest species depend on veteran trees and deadwood for their survival. Deadwood is providing habitat, shelter and food source for birds, bats and other mammals and is particularly important for the less visible majority of forest dwelling species: insects, especially beetles, fungi and lichens. Deadwood and its biodiversity also play a key role for sustaining forest productivity and environmental services such as stabilising forests and storing carbon.
>
> Despite its enormous importance, deadwood is now at a critically low level in many European countries, mainly due to inappropriate management practices in commercial forests and even in protected areas. Average forests in Europe have less than 5 per cent of the deadwood expected in natural conditions. The removal of decaying timber from the forest is one of the main threats to the survival of nearly a third of forest dwelling species and is directly connected to the long red list of endangered species. Increasing the amounts of deadwood in managed forests and allowing natural dynamics in forest protected areas would be major contributions in sustaining Europe's biodiversity.
>
> For generations, people have looked on deadwood as something to be removed from forests, either to use as fuel, or simply as a necessary part of "correct" forest management. Dead trees are supposed to harbour disease and even veteran trees are often regarded as a sign that a forest is being poorly managed. Breaking up these myths will be essential to preserve healthy forest ecosystems and the environmental services they provide.
>
> In international and European political processes, deadwood is increasingly being accepted as a key indicator of naturalness in forest ecosystems. Governments which have recognised the need to preserve the range of forest values and are committed to these processes can help reverse the current decline in forest biodiversity. This can be done by including deadwood in national biodiversity and forest strategies, monitoring deadwood, removing perverse subsidies that pay for its undifferentiated removal, introducing supportive legislation and raising awareness.

The FS fails to quantify the cumulative snag loss in previously and foreseeably logged areas or subject to other management-caused snag loss such as road accessed firewood cutting.

Bate et al. (2007), found that snag numbers were lower adjacent to roads due to removal for safety considerations, removal as firewood, and other management activities. Other literature has also indicated the potential for reduced snag abundance along roads (Wisdom et al. 2000).

The EA also fails to quantify expected snag loss due to safety concerns which vary with different methods of log removal.

Without any analysis, the FS merely assumes that management will result in snags and down logs in abundance to continuously support viable populations. No monitoring is cited to support claims of benefits to snag and down log-dependent species' population numbers or distribution.

The FS has stated: "Well distributed habitat is the amount and location of required habitat which assure that individuals from demes, distributed throughout the population's existing range, can interact. Habitat should be located so that genetic exchange among all demes is possible." (Mealey, 1983.) That document also provides guidance as to how habitat for the pileated woodpecker must be distributed for populations to persist.

The EA fails to apply the best available science to describe the quantity and quality of habitat that is necessary to sustain the viability of the pileated woodpecker.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies identified above.

NORTHERN GOSHAWK

Our October 29, 2018 comments raise the issue of old-growth associated wildlife species (p. 3).

We incorporate our discussion on the northern goshawk from our comments on the Draft Forest Plan and EIS (pp. 250-253).

The northern goshawk is a Clearwater National Forest MIS for old-growth forest habitat.

The White Pine EA does not contain analysis of the northern goshawk. In fact, it fails to discuss the concept of MIS in any way, including how population trend monitoring was a mechanism with which the FS was to assure viability of native wildlife species. The Forest Plan declares MIS are "used to monitor the effects of planned management activities on viable populations of wildlife and fish…". And after all, Forest Plan Goal 5.a. (Wildlife) is "Provide habitat for viable populations of all indigenous wildlife species." And Forest Plan assumption is, "The benchmark analysis indicated that old-growth stands exist in quantities sufficient to maintain viable populations of old-growth dependent wildlife species in each decade of the planning horizon." The EA ignores the fact that the FS has not monitored the population trends of its MIS as required by the Clearwater Forest Plan, thus neglecting to follow basic adaptive management principles as well as Forest Plan requirements. The Forest Plan requires the FS to monitor "Population Trends of Indicator Species", reporting at least every five years.

The Wildlife Report states, "One known active northern goshawk nest site is within the project area. This known site was monitored for the presence of goshawks in 2016, 2017, and 2018 but no detection occurred at or near the nest site." However there is no indication the FS has thoroughly searched for goshawk nest stands in the project area. The FS must utilize goshawk survey methodology consistent with the best available science. For example the recent and comprehensive protocol, “Northern Goshawk Inventory and Monitoring Technical Guide” by Woodbridge and Hargis 2006. Also, USDA Forest Service 2000b state:

> A common thread in the interviews was the lack of a landscape approach in providing goshawk habitat well distributed across the Forest (Squires, Reynolds, Boyce). Reynolds was deeply concerned that both alternatives focus only on 600 acres around known goshawk nests. He was concerned that this direction could be keeping the goshawk population artificially low. **Because goshawks move around within their territories, they are very difficult to find (Reynolds). There might be more goshawks on the Forest than currently known (Squires). One or two years of goshawk surveys is not enough (Reynolds). Some pairs may not lay eggs for five years (Reynolds). To get confidence in identifying nesting goshawk pairs, four to six years of surveys are needed (Reynolds)**. (Emphasis added.)

The Wildlife Report indicates that clearcutting will destroy 26% of the nesting habitat in the project area, commercial thinning will destroy another 3%, and fuel treatments will impact another 10%. It also indicates that clearcutting will destroy 27% of the foraging habitat in the project area, fuel treatments will impact 11%, and commercial thinning 3%. The project would clearcut 26% of the “historic” postfledging area, and commercial thinning will impact another 8%. There is no discussion of the loss of goshawk by new road building. Since neither the EA nor Wildlife Report include a cumulative effects analysis as required by NEPA, it is impossible to tell how much goshawk habitat has already been destroyed or degraded by logging, road building, and other management.

The Wildlife Report also demonstrates FS disregard for the historic goshawk territory thus: “Within the identified PFA, the viability for future short or long-term breeding use would be reduced due to decrease in canopy closure below 40%, decrease in 10”+ DBH trees, and increase in openings greater than 5 acres.”

Moser (2007) found that goshawk breeding home ranges in northern Idaho are much larger than other regions (mean of about 12,720 acres for males; 9,540 acres for females).

Reynolds et al. 1992 goshawk guidelines recommend ratios of (20%/20%/20%) each in the mid-aged forest, mature forest, and old forest Vegetative Structural Stage (VSS) classes for PFAs and foraging areas. Reynolds et al. 1992 calls for 100% in VSS classes 5 & 6 and 0% in VSS classes 1-4 in nest areas.

In addition, Reynolds et al. 1992 recommend logged openings of no more than 2 acres in size or less in the PFAs, depending on forest type, and logged openings of no more than 1-4 acres or less in size in the foraging areas, depending on forest type. Clough (2000) noted that in the absence of long-term monitoring data, a very conservative approach to allowing logging activities near active goshawk nest stands should be taken to ensure that goshawk distribution is not greatly altered. This indicates that the full 180-acre nest area management scheme recommended by

Reynolds et al. (1992) should be used around any active goshawk nest. Removal of any large trees in the 180-acre nesting area would contradict the Reynolds et al. (1992) guidelines.

Crocker-Bedford (1990) noted:

> After partial harvesting over extensive locales around nest buffers, reoccupancy decreased by an estimated 90% and nestling production decreased by an estimated 97%. Decreases were probably due to increased competition from open-forest raptors, as well as changes in hunting habitat and prey abundance.

Moser and Garton (2009) reported that all goshawk nests examined in their study area were found in stands whose average diameter of overstory trees was over 12.2 inches and all nest stands had > 70% overstory tree canopy. They described their findings as being similar to those described by Hayward and Escano (1989), who reported that nesting habitat "may be described as mature to overmature conifer forest with a closed canopy (75-85% cover)…."

The FS fails to apply the best available science to describe the quantity and quality of habitat necessary to sustain the viability of the northern goshawk.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies identified above.

PINE MARTEN

Our October 29, 2018 comments raise the issue of old-growth associated wildlife species (p. 3).

We incorporate our discussion on the pine marten from our comments on the Draft Forest Plan/Draft EIS (pp. 237-239).

The American marten was identified as a Clearwater National Forest MIS for mid- to high-elevation, mature forest. The White Pine EA does not contain analysis of the pine marten. In fact, it fails to discuss the concept of MIS in any way, including how population trend monitoring was a mechanism with which the FS was to assure viability of native wildlife species. The Forest Plan declares MIS are "used to monitor the effects of planned management activities on viable populations of wildlife and fish…". And after all, Forest Plan Goal 5.a. (Wildlife) is "Provide habitat for viable populations of all indigenous wildlife species." And Forest Plan assumption is, "The benchmark analysis indicated that old-growth stands exist in quantities sufficient to maintain viable populations of old-growth dependent wildlife species in each decade of the planning horizon." The EA ignores the fact that the FS has not monitored the population trends of its MIS as required by the Clearwater Forest Plan, thus neglecting to follow basic adaptive management principles as well as Forest Plan requirements. The Forest Plan requires the FS to monitor "Population Trends of Indicator Species", reporting at least every five years. The Wildlife Report acknowledges, however, that "Statewide trends for catch-per-unit-effort (measure of harvest per unit of time to predict population trends) have steadily declined from 2002 to 2012."

The Wildlife Report states, “A total of 528 acres of suitable pine marten habitat is modeled within the project area.”

The Wildlife Report states, “The combination of decreased mature habitat and an increase in openings would result in a decreased probability of marten occupancy.” It indicates that clearcutting will destroy 50% of the suitable habitat in the project area, commercial thinning will destroy or degrade another 10%, and fuel treatments will impact another 22%. Since neither the EA nor Wildlife Report include a cumulative effects analysis as required by NEPA, it is impossible to tell how much pine marten habitat has already been destroyed or degraded by logging, road building, and other management.

The Wildlife Report states “grand fir is targeted for removal due to its disease susceptibility. This would alter the forest composition to tree species not preferred by marten.” Yet another sign that this tree farming aspects of this Project are ill-advised for the overall integrity of the ecosystem.

The FS relies upon Region-wide database analyses by Samson to conclude that American marten and other species viability is assured, although the Wildlife Report does not address the age and reliability of the data. The FS also doesn’t consider Samson’s conclusions for the longer term, for any wildlife species, which is far less certain.

The pine marten is a species whose habitat is significantly altered by thinning and other active forest management. (See Moriarty et al., 2016; Bull and Blumton, 1999; Hargis et al., 1999 and Wasserman et al., 2012).

Moriarty et al., 2016 found that the odds of detecting a marten was 1,200 times less likely in openings and almost 100 times less likely in areas treated to reduce fuels, compared to structurally-complex forest stands.

Ruggiero et al. 1994b recognize that for martens, “trapper access is decreased, and de facto partial protection provided, by prohibitions of motorized travel.”

Old growth allows martens to avoid predators, provides resting and denning places in coarse woody debris and large diameter trees, and allows for access under the snow surface. USDA Forest Service, 1990 reviewed research suggesting that martens prefer forest stands with greater than 40% tree canopy closure and rarely venture more than 150 feet from forest cover, particularly in winter. USDA Forest Service, 1990 also cites research suggesting that at least 50% of female marten home range should be maintained in mature or old growth forest. Also, consideration of habitat connectivity is essential to ensuring marten viability: “To ensure that a viable population of marten is maintained across its range, suitable habitat for individual martens should be distributed geographically in a manner that allows interchange of individuals between habitat patches (Ibid.).

Ruggiero et al. 1994b recognize that for martens, “trapper access is decreased, and de facto partial protection provided, by prohibitions of motorized travel.”

The FS fails to apply the best available science to describe the quantity and quality of habitat that is necessary to sustain the viability of the pine marten.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies identified above.

VIABILITY

The Clearwater Forest Plan defines "viable population" as "A population which has adequate numbers and dispersion of reproductive individuals to ensure the continued existence of the species population in the planning area."

The Clearwater Forest Plan also requires population trend monitoring of MIS. By including MIS population trend monitoring requirements in forest plans, the agency acknowledged, wisely, that it needed to verify its assumption that allowing old-growth habitat to be reduced to 10% forestwide (a level well below the NRV)—assures viability of such species. The Forest Service has failed to meet its MIS monitoring commitments. The Forest Service failed to verify its minimum habitat old-growth MIS assumption.

USDA Forest Service, 1987d states:

> Defining viable populations and assessing diversity are difficult tasks in the time frame of the Forest Plan. The wildlife and fisheries section of the Forest Service Handbook on Planning (FSH 1902.12) defines a viable population as one that "consists of the number of individuals, adequately distributed throughout their range, sufficient to perpetuate their long-term existence in natural self-sustaining populations." Shaffer (1981) refines this definition by saying a minimum viable population is one that can withstand these environmental changes and have a 99 percent chance of surviving 1000 years. The terms viable, minimum viable and threshold level are often used interchangeably in relation to population levels. I prefer to distinguish between viable and minimum viable populations and consider a minimum viable population as a population at the threshold level of viability. Above the threshold the population is viable, below it isn't.

Salwasser and Hanley (1980) also list five factors that largely determine population viability. These factors are:

> 1. population size and density;
> 2. reproductive potential;
> 3. dispersal capability
> 4. competitive capability; and
> 5. habitat characteristics.
>
> (T)here are some wildlife species that are very sensitive to Forest activities and development such as timber sales, road construction, and oil, gas and mineral

> development. …Maintaining viable populations of these species will require special consideration. These species can be lumped into three categories:
> 1. endangered, threatened or sensitive species
> 2. old-growth dependent species; and
> 3. snag dependent species.

The Forest Service says a viable population is one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area.

The FS must address issues consistent with best available scientific information, such as the "estimated numbers", minimum number of reproductive individuals of each species, and population dynamics.

Traill et al., 2010 and Reed et al., 2003 are published, peer-reviewed scientific articles discussing what constitutes a minimum viable population. The FS does not identify best available scientific information that provides scientifically sound, minimum viable populations for any species.

The fact that the Clearwater NF has not monitored the population trends of its MIS as required by the Forest Plan bears more discussion. Considering potential difficulties of using population viability analysis at the project analysis area level (Ruggiero, et al., 1994a), the cumulative effects of carrying out multiple projects simultaneously across the Forest makes it imperative that population viability be assessed at least at the forest-wide scale (Marcot and Murphy, 1992). Also, temporal considerations of the impacts on wildlife population viability from implementing something with such long duration as a Forest Plan must be considered (*Id.*) but the FS has not done this either. It is also of paramount importance to monitor population trends (which the FS promised the public it would do during development of the Forest Plan) during Forest Plan implementation in order to validate assumptions used about long-term species persistence i.e., population viability (Marcot and Murphy, 1992; Lacy and Clark, 1993).

Schultz, 2010 criticizes Forest Service wildlife analyses based primarily upon habitat availability, because habitat alone is insufficient for understanding the status of populations. (See also Noon et al., 2003; Committee of Scientists, 1999.). Schultz, 2010 recommendations call for peer review of large-scale assessments and project level management guidelines, and for adoption of robust, scientifically sound monitoring and measurable objectives and thresholds for maintaining viable populations of native species.

Mills, 1994 also criticizes the FS's use of the term "viable" while only referring to habitat characteristics while ignoring population dynamics. Population dynamics refers to persistence of a population over time—which is key to making predictions about population viability. Mills, 1994 explains the range of parameters that must be used to make a scientifically sound assessment of wildlife species viability, including assessing population size, population growth rate, and linkages to other populations. Ruggiero, et al. (1994a) also point out that a sound population viability analysis must utilize measures of population dynamics. Finally, the USDA's 2000 NFMA planning regulations also recognized the importance of consideration of population dynamics for sustaining species. The FS fails to consider best available science on population dynamics.

The Wildlife Report states, "Quantification of suitable habitats for many species was based on the USDA Forest Service Northern Region wildlife habitat relationship models (Samson 2006a, Samson 2006b) or on Clearwater National Forest developed GIS models." It also states, "Population viability for some MIS (pileated woodpecker, goshawk, fisher and pine marten) has been addressed at the Regional level by Samson (2006b), who concluded well-distributed habitats exist in Region 1 and these habitats are present at levels well in excess of the amounts required to support minimum viable populations."

The Wildlife Report fails to address the fact that Sampson's analyses are about as old as a Forest Plan was designed to last, and who knows how old the data are that he used in his analyses. Samson did not evaluate long-term viability for the fisher and marten, but he did do so for the goshawk, pileated woodpecker, flammulated owl and black-backed woodpecker. Sampson concluded that "In regard to long-term viability, this conservation assessment has found that long-term habitat conditions in terms of Representativeness, Redundancy, and Resiliency are "low" for all species." The EA and Wildlife Report do not disclose Sampson's long-term viability conclusions. In his analysis, Sampson merely uses home range size for each species and makes assumptions of overlap in ranges of males and females. Home range size is then multiplied by the effective population size (n_e - a number that includes young and non-breeding individuals - Allendorf and Ryman 2002) and this is projected as the amount of habitat required to maintain a minimal viable population in the short-term. This simplistic approach ignores a multitude of factors and makes no assumptions about habitat loss or change over time. For the fisher and marten, Samson uses a "critical habitat threshold" as calculated in another publication (Smallwood 2002).

There are several problems with such an approach and the risk to the species would be extremely high if any of the species ever reached these levels in the Northern Region. Surely, all six species would be listed as endangered if this was to occur and the probabilities for their continued existence would be very low. There is also no way that National Forest Management Act (NFMA) and Endangered Species Act (ESA) requirements could be met of maintaining species across their range and within individual National Forests with such an approach. Mills (2007) captured the futility of such approach in his book on Conservation of Wildlife Populations: "MVP is problematic for both philosophical and scientific reasons. Philosophically, it seems questionable to presume to manage for the minimum number of individuals that could persist on this planet. Scientifically, the problem is that we simply cannot correctly determine a single minimum number of individuals that will be viable for the long term, because of inherent uncertainty in nature and management…"

Samson also admits that "Methods to estimate canopy closure, forest structure, and dominant forest type may differ among the studies referred to in this assessment and from those used by the Forest Service to estimate these habitat characteristics" and that "FIA sample points affected within the prior 10 years by either timber harvest or fire are excluded in the estimates of habitat for the four species" and finally that "FIA does not adequately sample rare habitats". This especially concerning given the reliance on the FIA queries to identify suitable habitat and the fact that the data used in the analysis is now likely at least 20 years old. There have been more wildfires in this time frame, and more large timber sales.

Thus, the short-term viability analysis is scientifically unsound and it is very doubtful it could sustain scientific peer review. Schultz (2010) captured this sentiment in her critique: "some interviewees also thought the work should be peer reviewed, especially if it was conducted by USFS management, and several were skeptical that it would survive such review."

We incorporate our discussion on viability from our comments on the Draft Forest Plan and EIS (pp. 131-133).

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies identified above.

CLIMATE CHANGE AND CARBON SEQUESTRATION

We raise this now to answer a purpose and need that was illegitimate under the Farm Bill authority (see our scoping letter pages 1-2) (and thus irrelevant to discuss), but is a legitimate discussion for projects authorized solely under the National Environmental Policy Act and no longer abridged by HFRA and the Farm Bill. We would have raised this if the project had been originally scoped under NEPA or the Forest Service had put out a drafted EA and hadn't skipped to the final. There has also been new science published between the 2018 scoping and now. And, finally, as this is the first time the public has had a chance to review this environmental assessment, this is the first time for us to see the resources the agency has used and point out what the agency has neglected to analyze. As this process is a pre-decisional review process, and you noted above that you would accept feedback at any time. We anticipate the Forest Service will consider these comments as it considers whether this project is a wise decision.

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

The year after the scoping period for White Pine (2018), researchers published an article (2019) prioritizing forest lands for preservation based on "carbon priority ranking with measures of biodiversity." This is new and important information that the Forest Service should consider in its analysis. The researchers mapped "high carbon priority forests in the western US exhibit features of older, intact forest with high structural diversity[], including carbon density and tree species richness." Buotte et al. 2019. Here is the map from that article:

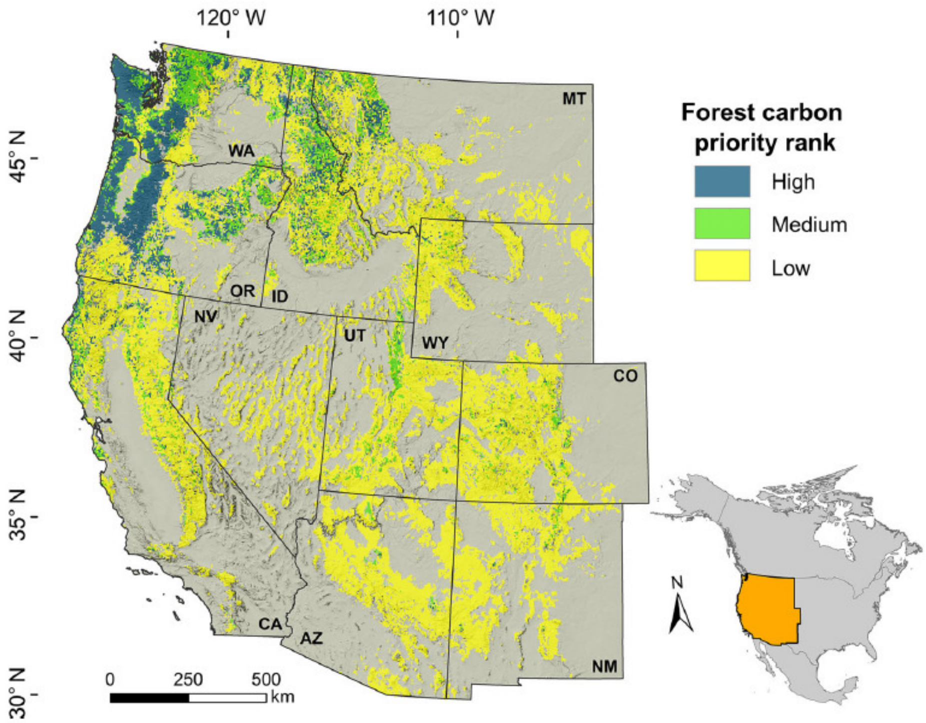

FIG. 1. Forested land in the western conterminous United States classified into priority for preservation to mitigate climate change based on the spatial co-occurrence of low vulnerability to drought and fire and low, medium, and high potential carbon sequestration. WA, Washington; ID, Idaho; MT, Montana;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

As you can see, the Nez Perce-Clearwater National Forests have a medium ranking with pockets of high rankings. This forest is worth preserving—it has an incredible ability to sequester carbon. Profita (Jan. 1, 2020).

This is the first opportunity to review the EA since the publication of the above article, and the first opportunity to review the science that the Forest Service has relied upon. The Forest Service lists the following as a reference:

> Schantz, R. 2015. NPCW Forest Plan revision: consideration of HRV-NRV and climate change in desired conditions for species composition and size classes. USDA Forest Service: Nez Perce-Clearwater National Forest. Kamiah, Idaho.

We don't know what this document contains, as at the time of this writing, this was neither provided with resources on the project's website, nor could we find a document by this author that discussed or explained such things in the planning file. The FS has the responsibility to inform the public the impacts of global warming, what science it is using to analyze its impacts, and how the Forest Service is doing its part to combat climate change by how it manages public lands.

While the above title implied that global warming will impact vegetation, we wanted to address how and why in a way that seems not to have been considered.

The FS (in USDA Forest Service, 2017b) discusses some effects of climate change on forests, including the following statement "In many areas, it will no longer be possible to maintain vegetation within the historical range of variability. Land management approaches based on current or historical conditions will need to be adjusted." Yet, the EA elaborates that one of the purposes and needs stated is to change the forested vegetation, stating "[h]istorically, the western white pine dominance type would have been the most common in the project and landscape area," and "Forest cover types will be moved toward pre-European settlement characteristics...." EA p. 4. Furthermore, the EA doesn't present a scientific basis to support its assumption that proposed "treatments" will result in sustainable vegetation conditions under increasing temperatures. Browne et. al. 2019 discussed that adaptational lag to temperature in valley oak (*Quercus lobata*) can be mitigated by genome-informed assisted gene flow. Even using seed source from local species may not hold for management practices because trees can lag in adapting to temperature. This has not been accounted for.

The EA fails to consider that the effects of climate change on the project area, including that the target "historical" or desired vegetation conditions will likely not be achievable or sustainable. The EA fails to provide any credible analysis as to how realistic and achievable its objectives are in the context of a rapidly changing climate, along an unpredictable but definitely changing trajectory.

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

The EA fails to acknowledge the likelihood that "…high seedling and sapling mortality rates due to water stress, competing vegetation, and repeat fires that burn young stands," which will likely lead to a dramatic increase in non-forest land acres. (Johnson, et al., 2016.)

In the recent revised Forest Plan Draft EIS for the Custer-Gallatin National Forest, the FS states, "Climate change is expected to continue and have profound effects on the Earth's ecosystems in the coming decades (IPCC 2007)." USDA 2019. As alarming as that might sound, the most recent report from the Intergovernmental Panel on Climate Change makes that 2007 report seem optimistic. *See* IPCC 2014.

Restoration efforts that aimed at trying to replicate how the Forest Service thinks things looked pre-European influence ignores the larger pattern of climate, ignores climate change, and ignores natural succession. *See* Millar and Wolfenden 1999 for a discussion on why patterns within the context of climate change are important.

We incorporate the following article from the *Missoulian* ("Fire study shows landscapes such as Bitterroot's Sapphire Range too hot, dry to restore trees") written by Rob Chaney (March 11, 2019):

> Burned landscapes like this drainage in the Sapphire Mountains hasn't been able to grow new trees since the Valley Complex fire of 2000, due to lack of soil moisture, humidity and seed trees, as well as excess heat during the growing season. University of Montana students Erika Berglund and Lacey Hankin helped

gather samples for a study showing tree stands are getting replaced by grass and shrubs after fire across the western United States due to climate change.

Fire-scarred forests like the Sapphire Range of the Bitterroot Valley may become grasslands because the growing seasons have become too hot and dry, according to new research from the University of Montana.

“The drier aspects aren’t coming back, especially on north-facing slopes,” said Kim Davis, a UM landscape ecologist and lead investigator on the study. “It’s not soil sterilization. Other vegetation like grasses are re-sprouting. It’s too warm. There’s not enough moisture for the trees.”

Davis worked with landscape ecologist Solomon Dobrowski, fire paleoecologist Philip Higuera, biologist Anna Sala and geoscientist Marco Maneta at UM along with colleagues at the U.S. Forest Service and University of Colorado-Boulder to produce the study, which was released Monday in the Proceedings of the National Academy of Sciences journal.

“What’s striking is if you asked scientists two decades ago how climate warming would play out, this is what they expected we’d see,” Higuera said. “And now we’re starting to see those predictions on the impact to ecosystems play out.”

The study concentrated on regrowth of Ponderosa pine and Douglas fir seedlings in Montana, Idaho, Colorado, New Mexico, Arizona and northern California. Field workers collected trees from 90 sites, including 40 in the northern Rocky Mountains, scattered within 33 wildfires that had occurred within the past 20 years.

“We did over 4,000 miles of road-tripping across the West, as well as lots of miles hiking and backpacking,” Davis said. The survey crews brought back everything from dead seedlings to 4-inch-diameter tree rings; nearly 3,000 samples in total. Then they analyzed how long each tree had been growing and what conditions had been when it sprouted.
Before the 1990s, the test sites had enough soil moisture, humidity and other factors to recruit new seedlings after forest fires, Dobrowski said.

“There used to be enough variability in seasonal conditions that seedlings could make it across these fixed thresholds,” Dobrowski said. “After the mid-‘90s, those windows have been closing more often. We’re worried we’ll lose these low-elevation forests to shrubs or grasslands. That’s what the evidence points to.”

After a fire, all kinds of grasses, shrubs and trees have a blank slate to recover. But trees, especially low-elevation species, need more soil moisture and humidity than their smaller plant cousins. Before the mid-90s, those good growing seasons rolled around every three to five years. The study shows such conditions have evaporated on virtually all sites since 2000.

> "The six sites we looked at in the Bitterroots haven't been above the summer humidity threshold since 1997," Higuera said. "Soil moisture hasn't crossed the threshold since 2009."
>
> The study overturns some common assumptions of post-fire recovery. Many historic analyses of mountain forests show the hillsides used to hold far fewer trees a century ago, and have become overstocked due to the efforts humans put at controlling fire in the woods. Higuera explained that some higher elevation forests are returning to their more sparse historical look due to increased fires.
>
> "But at the lower fringes, those burn areas may transition to non-forest types," Higuera said, "especially where climate conditions at the end of this century are different than what we had in the early 20th Century."
>
> The study also found that soil sterilization wasn't a factor in tree regrowth, even in the most severely burned areas. For example, the 2000 Sula Complex of fires stripped forest cover in the southern end of the Bitterroot Valley. While the lodgepole pine stands near Lost Trail Pass have recovered, the lower- elevation Ponderosa pine and Douglas firs haven't.
>
> Another factor driving regeneration is the availability of surviving seed trees that can repopulate a burn zone. If one remains within 100 meters of the burned landscape, the area can at least start the process of reseeding. Unfortunately, the trend toward high-severity fires has reduced the once-common mosaic patterns that left some undamaged groves mixed into the burned areas.
>
> Higuera said he hoped land managers could use small or prescribed fires to make landscapes more resilient, as well as restructure tree-planting efforts to boost the chances of heavily burned places.

We've provided the scientific publication as well: *see* Davis et al. 2019. The Resources Planning Act of 1974 (RPA) and National Forest Management Act of 1976 (NFMA) mandate long-range planning which impose numerous limitations on timber extraction practices and the amount of timber sold annually. These long-range plans are based on assumptions, which are based on data, expert opinion, public participation and other factors which mostly view from a historical perspective. So it's time to peer into the future to examine closely (NEPA: "take a hard look at") those assumptions. The EA fails to assess and disclose all risks associated with vegetative-manipulation as proposed.

There is scientific certainty that climate change has reset the deck for future ecological conditions. For example, Sallabanks, et al., 2001:

> (L)ong-term evolutionary potentials can be met only by accounting for potential future changes in conditions. …Impending changes in regional climates …have the capacity for causing great shifts in composition of ecological communities.

Conventional wisdom dictates that forests regenerate and recover from wildfire. If that's true, then it's logical to conclude that forests can regenerate and recover from logging. And these days, "resilience" is a core tenant of FS planning. Unfortunately, assumptions of the EA relating to historic and desired conditions are incorrect. NEPA requires a "hard look" at the best available science relating to future concentrations of greenhouse gases and gathering climate risk as we move forward into an increasingly uncertain and uncharted climate future. This has not been done. The White Pine EA does not include a legitimate climate-risk analysis, much less one based on the best available science.

No amount of logging, thinning and prescribes burning will cure the cumulative effects (irretrievable loss) already baked into the foreseeably impending climate chaos. "Treatments" must be acknowledged for what they are: adverse cumulative environmental effects. Logging can neither mitigate, nor prevent, the effects of wildfire or logging. Both cause disturbance to forests that cannot be restored or retrieved—the assumed resilience no longer exists. It is way too late in the game to pretend to ignore the elephant in the room.

The FS ignores best available science indicating prescribed fire, thinning and logging are actually cumulative with the dominant forces of increased heat, drought, and wildfire.

NEPA requires analysis of an alternative that reflects our common understanding of climate risk. A considerable amount of data and scientific research repeatedly confirms that we may be looking in the wrong direction (back into history, e.g., "historic conditions") for answers to better understand our forest future.

The FS fails to analyze an alternative projecting climate science into the forest's future. It fails to adequately consider that the effects of climate risk represent a significant and eminent loss of forest resilience already, and growing risk into the "foreseeable future."

Davis et al., 2019 state: "At dry sites across our study region, seasonal to annual climate conditions over the past 20 years have crossed these thresholds, such that conditions have become increasingly unsuitable for regeneration. High fire severity and low seed availability further reduced the probability of postfire regeneration. Together, our results demonstrate that climate change combined with high severity fire is leading to increasingly fewer opportunities for seedlings to establish after wildfires and may lead to ecosystem transitions in low-elevation ponderosa pine and Douglas-fir forests across the western United States."

Forests are already experiencing emissions-driven deforestation, on both the post-fire and post-logging acreage.

The EA does not disclose restocking monitoring data and analysis.

This agency's response to global warming, as documented in an EA, also must go beyond merely considering what species of trees will grow back. The Forest Service must account for how it is contributing to global warming, by both its carbon emissions and how this project will impact carbon sequestration. There is no cumulative effects analysis of NPCNF carbon sequestration over time.

Logging does more damage than it does good in terms of a climate analysis. For example, "Compared with other terrestrial ecosystems, forests store some of the largest quantities of carbon per surface area of land." Achat et al. 2015. Much of the carbon stored is within the soils, with a smaller part in the vegetation. *Id.* Forest management can modify soil organic carbon stocks, losing soil organic carbon when comparing conventional harvests like clearcutting or shelterwood cutting with unharvested forests. Id. Not only does it lose the carbon stored in the soils, but cutting trees eliminates the trees' potential to continue to sequester carbon. *Id.* Logging also doesn't increase carbon storage in the US by reducing future fire emissions. Research has found high carbon losses associated with "fuel treatment" and only modest differences associated with the high-severity fire and low severity fire that fuel treatment is meant to encourage. Campbell et al. 2012. And where some disturbances like insects, disease, and fire kill trees and lower carbon sequestration, logging has the greater impact--up to ten times the carbon from forest fires and bark beetles together. *See* Harris et al. 2016. Please do an analysis that recognizes this.

Also, logging does not keep carbon out of the atmosphere. The below graphic is from the Josephine County Democrats Webpage, Forest Defense is Climate Defense (https://josephinedemocrats.org/forest-defense-is-climate-defense/), where the illustrator used the information in Gower et al. 2003 and Smith et al. 2006 to create the following illustration of how carbon is lost into the atmosphere from logging.

Logging does not serve to increase carbon sequestration in the future. McKinley et al. 2011 states, "Because forest carbon loss contributes to increasing climate risk and because climate change may impede regeneration following disturbance, avoiding deforestation and promoting regeneration after disturbance should receive high priority as policy considerations." One specific strategy McKinley et al. also discusses is decreasing forest harvests, either by interval or intensity, to increase forest carbon stocks. McKinley et al. 2011 recognizes, "Generally, harvesting forests with high biomass and planting a new forest will reduce overall carbon stocks more than if the forest were retained, even counting the carbon storage in harvested wood products." The strategy of harvesting and replanting might work for southeastern forests, but not the Nez Perce-Clearwater National Forests. Avoiding deforestation, afforestation, and reducing harvest are the first three strategies that McKinley et al. 2011 list. Because McKinley et al. 2011 recognizes that avoiding deforestation and reducing harvest as strategies for carbon storage in forests, acknowledging that climate change may impede regeneration, this article states something contradictory than the agency's representation of it and this article provides contrary support for a different strategy than the logging that the agency proclaims will help.

The position that this Forest generally takes when we raise these issues is that its project impacts on climate change is that the project would have a miniscule impact on global carbon emissions. The obvious problem with that viewpoint is, once can say the same thing about every source of carbon dioxide and other greenhouse gas emission on earth, and likewise justify inaction as does this EA. In their comments on the KNF's Draft EIS for the Lower Yaak, O'Brien, Sheep project, the EPA rejected that sort of analysis, basically because that cumulative effects scale dilutes project effects. *See* USDA, Forest Service, Kootenai National Forest Lower Yaak, O'Brien, Sheep FEIS pp. 818-19. We would add that, if the FS wants to refer to a wider scope to analyze its carbon footprint, we suggest that it actually conduct such a cumulative effect analysis and disclose it in a NEPA document.

Conversely, Depro et al., 2008 found that ending commercial logging on U.S. national forests and allowing forests to mature instead would remove an additional amount of carbon from the atmosphere equivalent to 6 percent of the U.S. 2025 climate target of 28 percent emission reductions.

Forest recovery following logging and natural disturbances are usually considered a given. But forests have recovered under climatic conditions that no longer exist. Higher global temperatures and increased levels of disturbance are contributing to greater tree mortality in many forest ecosystems, and these same drivers can also limit forest regeneration, leading to vegetation type conversion. (Bart et al., 2016.)

The importance of trees for carbon capture will rise especially if, as recent evidence suggests, hopes for soils as a carbon sink may be overly optimistic. (He et al., 2016) Such a potentially reduced role of soils doesn't mean that forest soils won't have a role in capture and storage of carbon, rather it puts more of the onus on aboveground sequestration by trees, even if there is a conversion to unfamiliar mixes of trees.

The EA entirely fails to quantify CO_2 and other greenhouse gas emissions from other common human activities related to forest management and recreational uses. These include emissions associated with machines used for logging and associated activities, vehicle use for administrative actions, recreational motor vehicles, and emissions associated with livestock grazing. The FS is simply ignoring the climate impacts of these management and other authorized or allowed activities.

Law and Harmon, 2011 conducted a literature review and concluded …

> Thinning forests to reduce potential carbon losses due to wildfire is in direct conflict with carbon sequestration goals, and, if implemented, would result in a net emission of CO2 to the atmosphere because the amount of carbon removed to change fire behavior is often far larger than that saved by changing fire behavior, and more area has to be harvested than will ultimately burn over the period of effectiveness of the thinning treatment.

Best available science supports the proposition that forest policies must shift away from logging if carbon sequestration is prioritized.[16] Forests must be preserved indefinitely for their carbon

[16] "More logging and reforestation occur annually in the U.S., including on our public lands, than in any other nation in the world." John Muir Project of Earth Island Institute 2018. *Protecting Forests from Logging: The Missing Piece Necessary to Combat Climate Change*. *See also* Hansen et al 2013 High-resolution Global Maps of 21st-Century Forest Cover Change. Science 342: 850-853; Prestemon, J.P., et al. 2015. The global position of the U.S. forest products industry.

storage value. Forests that have been logged should allowed to convert to eventual old-growth condition. This type of management has the potential to double the current level of carbon storage in some regions. (*See* Harmon and Marks, 2002; Harmon, 2001; Harmon et al., 1990; Homann et al., 2005; Law, 2014; Solomon et al., 2008; Turner et al., 1995; Turner et al., 1997; Woodbury et al., 2007.)

Moomaw and Smith, 2017 state:

> Multiple studies warn that carbon emissions from soil due to logging are significant, yet under-reported. One study found that logging or clear-cutting a forest can cause carbon emissions from soil disturbance for up to fifty years. Ongoing research by an N.C. State University scientist studying soil emissions from logging on Weyerhaeuser land in North Carolina suggests that "logging, whether for biofuels or lumber, is eating away at the carbon stored beneath the forest floor."

Moomaw and Smith, 2017 examined the scientific evidence implicating forest biomass removal as contributing to climate change:

> All plant material releases slightly more carbon per unit of heat produced than coal. Because plants produce heat at a lower temperature than coal, wood used to produce electricity produces up to 50 percent more carbon than coal per unit of electricity.
>
> Trees are harvested, dried, and transported using fossil fuels. These emissions add about 20 percent or more to the carbon dioxide emissions associated with combustion.

Keith et al., 2009 state:

> Both net primary production and net ecosystem production in many old forest stands have been found to be positive; they were lower than the carbon fluxes in young and mature stands, but not significantly different from them. Northern Hemisphere forests up to 800 years old have been found to still function as a carbon sink. Carbon stocks can continue to accumulate in multi-aged and mixed species stands because stem respiration rates decrease with increasing tree size, and continual turnover of leaves, roots, and woody material contribute to stable components of soil organic matter. There is a growing body of evidence that forest ecosystems do not necessarily reach an equilibrium between assimilation and respiration, but can continue to accumulate carbon in living biomass, coarse woody debris, and soils, and therefore may act as net carbon sinks for long periods. Hence, process-based models of forest growth and carbon cycling based on an assumption that stands are even-aged and carbon exchange reaches an equilibrium may

> underestimate productivity and carbon accumulation in some forest types. Conserving forests with large stocks of biomass from deforestation and degradation avoids significant carbon emissions to the atmosphere. Our insights into forest types and forest conditions that result in high biomass carbon density can be used to help identify priority areas for conservation and restoration.

Hanson, 2010 addresses some of the false notions often misrepresented as “best science” by agencies, extractive industries and the politicians they’ve bought:

> Our forests are functioning as carbon sinks (net sequestration) where logging has been reduced or halted, and wildland fire helps maintain high productivity and carbon storage.
>
> Even large, intense fires consume less than 3% of the biomass in live trees, and carbon emissions from forest fires is only tiny fraction of the amount resulting from fossil fuel consumption (even these emissions are balanced by carbon uptake from forest growth and regeneration).
>
> "Thinning" operations for lumber or biofuels do not increase carbon storage but, rather, reduce it, and thinning designed to curb fires further threatens imperiled wildlife species that depend upon post-fire habitat.

Campbell et al., 2012 also refutes the notion that fuel-reduction treatments increase forest carbon storage in the western US:

> It has been suggested that thinning trees and other fuel-reduction practices aimed at reducing the probability of high-severity forest fire are consistent with efforts to keep carbon (C) sequestered in terrestrial pools, and that such practices should therefore be rewarded rather than penalized in C-accounting schemes. By evaluating how fuel treatments, wildfire, and their interactions affect forest C stocks across a wide range of spatial and temporal scales, we conclude that this is extremely unlikely. Our review reveals high C losses associated with fuel treatment, only modest differences in the combustive losses associated with high-severity fire and the low-severity fire that fuel treatment is meant to encourage, and a low likelihood that treated forests will be exposed to fire. Although fuel-reduction treatments may be necessary to restore historical functionality to fire-suppressed ecosystems, we found little credible evidence that such efforts have the added benefit of increasing terrestrial C stocks.

Mitchell et al. (2009) also refutes the assertion that logging to reduce fire hazard helps store carbon, and conclude that although thinning can affect fire, management activities are likely to remove more carbon by logging than will be stored by trying to prevent fire.

Heat, a long-established topic of physics, plays an equally important role at the level of plant and animal physiology—every organism only survives and thrives within thermal limits. For example, Pörtner et al. (2008) point out, “All organisms live within a limited range of body temperatures… Direct effects of climatic warming can be understood through fatal decrements in an organism's performance in growth, reproduction, foraging, immune competence, behaviors and competitiveness.” The authors further explain, “Performance in animals is supported by aerobic scope, the increase in oxygen consumption rate from resting to maximal.” In other words, rising heat has the same effect on animals as reducing the oxygen supply, and creates the same difficulties in breathing. But breathing difficulties brought on by heat can have important consequences even at sub-lethal levels. In the case of grizzly bears, increased demand for oxygen under increasing heat has implications for vigorous (aerobically demanding) activity including digging, running in pursuit of prey, mating, and the play of cubs.

Moomaw and Smith, 2017 conclude:

> With the serious adverse consequences of a changing climate already occurring, it is important to broaden our view of sustainable forestry to see forests …as complex ecosystems that provide valuable, multiple life-supporting services like clean water, air, flood control, and carbon storage. We have ample policy mechanisms, resources, and funding to support conservation and protection if we prioritize correctly.
>
> …We must commit to a profound transformation, rebuilding forested landscapes that sequester carbon in long-lived trees and permanent soils. Forests that protect the climate also allow a multitude of species to thrive, manage water quality and quantity and protect our most vulnerable communities from the harshest effects of a changing climate.
>
> Protecting and expanding forests is not an “offset” for fossil fuel emissions. To avoid serious climate disruption, it is essential that we simultaneously reduce emissions of carbon dioxide from burning fossil fuels and bioenergy along with other heat trapping gases and accelerate the removal of carbon dioxide from the atmosphere by protecting and expanding forests. It is not one or the other. It is both!
>
> Achieving the scale of forest protection and restoration needed over the coming decades may be a challenging concept to embrace politically; however, forests are the only option that can operate at the necessary scale and within the necessary time frame to keep the world from going over the climate precipice. Unlike the fossil fuel companies, whose industry must be replaced, the wood products industry will still have an important role to play in providing the wood products that we need while working together to keep more forests standing for their climate, water, storm protection, and biodiversity benefits.
>
> It may be asking a lot to “rethink the forest economy” and to “invest in forest stewardship,” but tabulating the multiple benefits of doing so will demonstrate that often a forest is worth much more standing than logged. Instead of subsidizing the logging of forests for lumber, paper and fuel, society should pay for the multiple benefits of standing forests. It is time to value U.S. forests

> differently in the twenty-first century. We have a long way to go, but there is not a lot of time to get there.

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

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

Harmon, 2009 is the written record of "Testimony Before the Subcommittee on National Parks, Forests, and Public Lands of the Committee of Natural Resources for an oversight hearing on The Role of Federal Lands in Combating Climate Change." The author "reviews, in terms as simple as possible, how the forest system stores carbon, the issues that need to be addressed when assessing any proposed action, and some common misconceptions that need to be avoided." His testimony begins, "I am here to …offer my expertise to the subcommittee. I am a professional scientist, having worked in the area of forest carbon for nearly three decades. During that time I have conducted numerous studies on many aspects of this problem, have published extensively, and provided instruction to numerous students, forest managers, and the general public."

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

For the above reasons, this EA is utterly insufficient. It doesn't recognize or analyze highly relevant information or apply the science that render the EA's underlying assumptions scientifically controversial. It doesn't disclose high-quality information to the public, and it doesn't take a hard look at this proposed action in the manner needed above. This is compounded by the multitude of projects in this area, which represent cumulative effects that could be analyzed for carbon sequestration and global warming impacts at local and regional levels. This EA violations the National Environmental Policy Act.

Please reconsider your land-management approach to one of conservation.

Remedy:
1) Choose the no-action alternative
2) Withdraw the project
3) Address the above and correct these deficiencies in an EIS.

SOIL

Our October 29, 2018 comments on the Proposed Action stated, "Other than a brief mention of soil impacts from recreation and some roads, there is nothing about soil conditions and how that might change."

We incorporate our comments regarding soil (pp. 76-109) on the Draft Revised Forest Plan and Draft EIS within this Objection.

A. Project inconsistency with Forest Plan and Region 1 Soil Quality Standards.

The FS fails to demonstrate consistency with Forest Plan direction and the Region 1 Soil Quality Standards (R1 SQS)—failing to accurately disclose existing amount of detrimental soil disturbance (DSD) within each activity area, failing to provide accurate estimates of DSD that would be attributable to project activities, and failing to provide reliable estimates of cumulative, post-project DSD in activity areas. Data in disturbance tables don't correlate with field survey data.

The Clearwater Forest Plan includes the Forestwide Goal to "Insure that soil productivity is maintained and no irreversible damage occurs to soil and water resources from Forest management activities." The FS has ignored that goal from day 1.

Clearwater Forest Plan Soil Standard #11(a) states, "Manage activities on lands with ash caps such that bulk densities on at least 85 percent of the area remain at or below 0.9 gram/cubic centimeter." The FS fails to demonstrate consistency with this standard. Nothing in the Soil Report indicates soil bulk density has been measured. This Forest Plan standard's limitations of increase in bulk density and R1 SQS limitations on DSD are not reconciled. Notice how, from the Soil Report, compliance with this Standard is being sidestepped:

Standard	Compliance Achieved By:
Manage activities on lands with ash caps such that bulk densities on at least 85 percent of the area remain at or below 0.9 gram/cubic centimeters.	Project design and mitigation measures to minimize soil erosion, compaction and displacement.

Geist et al., 1990 describe a methodology using a sampling grid, and they demonstrate that taking bulk soil density samples is quite feasible. This is necessary because deep, not necessarily visible subsurface compaction has been detected long after logging activities (e.g. Page-Dumroese, 1993).

Here's another statement from science and common sense in the Soil Report which the White Pine project analysis's DSD methodology ignores: "Surface layers to a depth of several centimeters generally recover to undisturbed bulk densities faster than the subsurface layers, but the effects of unmitigated compaction can last for decades (Froehlich et al. 1985)." (Emphasis added.) There is nothing in the EA or Soil Report that shows the FS will investigate this excruciatingly slow recovery of subsurface compaction. This is in regards to soil conditions deeper than a ripper, and even freeze-thaw processes, typically reach.

Page-Dumroese, et al., 2007 discuss wildly variable results of different soil compaction instruments, which is why the FS must explain the limitations of the compaction survey methodology. Determining compaction without providing a scientific basis for its accuracy or validity, is arbitrary and capricious.

Craigg and Howes (in Page-Dumroese, et al. 2007) state:

> Meaningful soil disturbance standards or objectives must be based on measured and documented relationships between the degree of soil disturbance and subsequent tree growth, forage yield, or sediment production. Studies designed to determine these relationships are commonly carried out as part of controlled and replicated research projects. The paucity of such information has caused problems in determining threshold levels for, or defining when, detrimental soil disturbance exists; and in determining how much disturbance can be tolerated on a given area of land before unacceptable changes in soil function (productive potential or hydrologic response) occur. Given natural variability of soil properties across the landscape, a single set of standards for assessing detrimental disturbance seems inappropriate.

Craigg and Howes (in Page-Dumroese, et al. 2007) state:

> Each soil has inherent physical, chemical, and biological properties that affect its ability to *function* as a medium for plant growth, to regulate and partition water flow, or to serve as an effective environmental filter. When any or a combination of these inherent factors is altered to a point where a soil can no longer *function* at its maximum *potential* for any of these purposes, then its quality or health is said to be reduced or impaired (Larson and Pierce 1991).

The Soil Report states, "The presence of soil disturbance and **disturbance class** is determined at each point, and the percent soil disturbance of each treatment unit is calculated. Calculations based on monitoring and research (Archer 2008; Reeves et al 2011) were used to estimate soil disturbance from the proposed actions." (Emphasis added.) However the concept of "disturbance class" is not found in Archer 2008 or Reeves et al., 2011. This classification is extremely subjective and not based upon DSD definitions. There is no discussion of the reliability of this system, for example the agreement between any given rater and others. So from document O-0011_DateUnknown_SoilsData_WP UnitSummaries we read, "Compaction at points 25, 26, and 29 were the worse we have seen. We gave the disturbance class a 3 for each." Based on what—nobody can tell.

From Reeves et al 2011, we find the following “Detrimental Soil Impacts Definition”:

> Existence of one, or a combination of any, of the attri-butes listed below can indicate detrimental soil conditions. After management activities of harvesting and site prepa-ration, 85% of the activity area (harvest unit) must be in a satisfactory condition (without detrimental impacts). The Northern Region SQS define detrimental impacts as the fol-lowing (FSM 2500-99-1):
> *Compaction:* a 15% increase in the natural bulk density. Cumulative effects of multiple site entries should be considered.
> *Rutting:* wheel ruts at least 2 inches (5 cm) deep in wet soils.
> *Displacement*: removal of ≥1inch (2.5 cm) of any surface horizon, usually the A horizon, from a continuous area greater than 100 ft2 (9.2 m2).
> *Severely burned soil:* physical and biological changes to the soil resulting from high-intensity burns of long duration as described in the Burned-Area Emergency Rehabilitation Handbook (FSH 2509.13).
> *Surface erosion:* rills, gullies, pedestals, and soil deposition.
> *Soil mass movement:* any soil mass movement caused by management activity.

Again, soil bulk density wasn’t measured or estimated.

Clearwater Forest Plan Soil Standard #11(b) states, “Design resource management activities to maintain soil productivity and minimize erosion.” The FS fails to demonstrate consistency with this standard. The FS fails to correlate this Forest Plan standard’s mandate to maintain soil productivity and the R1 SQS proxy—limitations on DSD.

The FS also fails to demonstrate consistency with Clearwater Forest Plan Soil Standard #11(c), which states, “The minimum coordinating requirements for projects on land types with high or very high mass stability or parent material erosion hazard ratings are:

> (1) The field verification of the mapped unit and predicted hazard rating.
> (2) Review road locations using a team consisting of an engineering geologist, hydrologist, soil scientist, and a silviculturist. Assess concerns and possible mitigation measures to determine if a geotechnical investigation is needed.
> After the "P" line has been located, stake mitigating road designs, using the original ID team members and road designer.

The R1 SQS defines DSD:

> 1. <u>Detrimental Soil Disturbance.</u> These disturbances includes the effects of compaction, displacement, rutting, severe burning, surface erosion, loss of surface organic matter, and soil mass movement. At least 85 percent of an activity area must have soil that is in satisfactory condition. Detrimental conditions include:

Compaction. Detrimental compaction is a 15 percent increase in natural bulk density. The cumulative effects of multiple site entries on compaction should also be considered since compacted soils often recover slowly.

Rutting. Wheel ruts at least 2 inches deep in wet soils are detrimental.

Displacement. Detrimental displacement is the removal of 1 or more inches (depth) of any surface soil horizon, usually the A horizon, from a continuous area greater than 100 square feet.

Severely-burned Soil. Physical and biological changes to soil resulting from high-intensity burns of long duration are detrimental. This standard is used when evaluating prescribed fire. Guidelines for assessing burn intensity are contained in the Burned-Area Emergency Rehabilitation Handbook (FSH 2509.13).

Surface Erosion. Rills, gullies, pedestals, and soil deposition are all indicators of detrimental surface erosion. Minimum amounts of ground cover necessary to keep soil loss to within tolerable limits (generally less than 1 to 2 tons per acres per year) should be established locally depending on site characteristics.

Soil Mass Movement. Any soil mass movement caused by management activities is detrimental.

From the Soil Report, it is impossible to determine how well or how accurately the amount of DSD was measured from past management activities that disturbed and damaged soil.

The Soil Report states, “The soil disturbance estimates of proposed activities used in this project are mostly based on local monitoring and research results (Archer 2008, Reeves et al. 2011).”

For each type of ground based logging, the Archer, 2008 average was at least 13% and the reported range was “Tractor harvest led to 8 to 22% detrimental disturbance after harvest.” An estimate based upon those results is not found in any part of the analysis we can find.

While the Soil Report acknowledges inaccuracies and data limitations, it still obscures the reliability of DSD data gathered by the methods the FS relied upon for the soils analysis. No inter-rater reliability determination was made. The FS analysis is not based upon high quality data.

The EA does not provide a statistically sound explanation of how accurate the values are, or what percentage error can be expected of its existing and estimated values for DSD. This renders the estimates and measures of DSD inadequate for demonstrating consistency with forest plan standards and the R1 SQS, in violation of NFMA.

The Soil Report states, “Conditions in the project area are a result of both natural processes and human activities. Potential soil disturbance within the analysis area can be attributed to fires or past management activities including timber sales, thinning projects, dispersed recreation sites, and grazing activities." Existing DSD from cattle is not properly quantified in the EA or Soil Report. In fact, there is no analysis of cumulative effects to soil from livestock grazing.

The EA and Soil Report claim that if design features are followed, the detrimental effects of the proposed action will not exceed the R1 SQS or Forest Plan standards. Again, the FS fails to provide adequate basis for that conclusion, and fails to explain the discrepancy between that statement and the results of monitoring it cites (Archer, 2008).

National forests in R-1 have monitored DSD with very mixed results. For example, a recent IPNF forest plan monitoring report (USDA Forest Service 2013a) revealed the relatively high frequency of violating their 15% standard, despite implementation of design features and BMPs. In fact, Reeves et al., 2011 (cited in the EA) found mixed results on compliance with the R-1 15% standard, with average DSD for activity areas for some Forests over 15%. Our point is, FS pledges to meet standards must be taken with a grain of salt.

NEPA requires that agencies specify the effectiveness of their mitigations. 40 C.F.R. 1502.16. The EA fails to specify the effectiveness of its mitigation of DSD. There is no **quantitative** monitoring data that demonstrates DSD remediation activities have taken a CNF activity area with DSD amounts violating the quantitative standard to an amount that no longer violates the standard. The project includes design criteria to utilizing existing skid trails and ripping and seeding of skid trail convergence areas, presumably to accelerate restoration of soil functioning and reduce DSD. However, USDA Forest Service 2005d states:

> **Decompaction** can at least **partly restore** soil porosity and productivity. Soil displacement that mixes or removes the volcanic ash surface layer reduces soil moisture holding capacity, which may be **irreversible and irretrievable**. (Emphasis added.)

The soil report states, "Past monitoring and research indicate that the effectiveness of the project design features would be moderate to high (McNabb and Froehlich 1983; Graham et al. 1994; Graham et al. 1999; Korb et al, 2004; Neary et al. 2009; Curran et al. 2005a, b; Wagenbrenner et al. 2015)." This begs the question: which of those studies uses the FS definition of DSD to judge "effectiveness" of the mitigations? The fact that the FS is not accepting or responding to comments on the EA reveals that NEPA compliance is not high on the agency priority list.

Then there is the issue of the reliability and validity of the soil survey methods used by the FS. USDA Forest Service, 2012a states:

> The U.S. Forest Service Soil Disturbance Field Guide (Page-Dumroese et al., 2009) was used to establish the sampling protocol.
>
> …Field soil survey methodology based on visual observations, such as the Region 1 Soil Monitoring Guide used here, can produce variable results among observers, and the confidence of results is dependent on the number of observations made in an area (Page-Dumroese et al., 2006). **The existing and estimated values for detrimental soil disturbance (DSD) are not absolute** and best used to describe

> the existing soil condition. The calculation of the percent of additional DSD from a given activity is an estimate since DSD is a combination of such factors as existing groundcover, soil texture, timing of operations, equipment used, skill of the equipment operator, the amount of wood to be removed, and sale administration. (Emphasis added.)

Horn et al., 2007 state:

> Generally, the data obtained for the measured soil stresses and the natural bearing capacity **prove that sustainable wheeling is impossible, irrespective of the vehicle type and the working process.** Top and subsoil compaction, an increase in precompression stress values in the various soil horizons, deep rut depth and vertical and horizontal soil displacement associated with shearing effects take place and affect the mechanical strength of forest soils...
>
> For future forest use, deformed [compacted] areas must be classified as long-term irreversibly degraded (if we compare the nearly non-existing plant growth in traffic lanes more than 20 years old, not shown in this publication, but derived from in situ observations). They require, with respect to regaining pore functioning, many decades, if swelling and shrinkage, as well as biological strengthening, processes occur.

Following a study by Cullen et al., 1991 the authors concluded: "This result lends support to the general observation that most compaction occurs during the first and second passage of equipment." Page-Dumroese (1993), in a Forest Service research report investigating logging impacts on volcanic ash-influenced soil in the Idaho Panhandle National Forest, states, "Moderate compaction was achieved by driving a Grappler log carrier over the plots twice." Page-Dumroese (1993) also cited other studies that indicated: "Large increases in bulk density have been reported to a depth of about 5 cm with the first vehicle pass over the soil." Williamson and Neilsen (2000) assessed change in soil bulk density with number of passes and found 62% of the compaction to the surface 10cm to come with the first pass of a logging machine. In fine textured soils Brais and Camire (1997) demonstrated that the first pass creates 80 percent of the total disturbance to the site. The FS fails to consider and use the best available science, in violation of NFMA and additionally, NEPA's requirements for scientific integrity. *See* 36 C.F.R. 219.3; 40 C.F.R. 1502.24.

The FS does not properly account for all the long-term DSD in the project area, including locations outside current "activity areas." The NPCNF's recent Lolo Insects and Disease FEIS discloses:

> The limited soil productivity recovery in the areas impacted by roads and skid trails, even after 50 years of natural recovery, mirrors the results of recent research showing that abandoned roads, even well vegetated abandoned roads with 50 or more years of trees and shrubs, have levels of soil compaction, nutrients, and infiltration capacity similar to open and driveable roads (Lloyd et al, 2013; Foltz et al, 2007).

> …Although soil recovery could still occur in remaining subsurface soils, the exceptionally high porosity and water-holding properties of the Mazama ash cap would likely be irrecoverable.

The Soil Report and EA are inconsistent in regards to ash cap soils. In some places the FS admits that loss of the ash cap due to erosion or displacement is essentially permanent (DSD), in other places it exclaims that the soils will recover so it won't be DSD. Such a gross inconsistency is a violation of NEPA.

The FS does not disclose the efficacy of particular BMPs for insuring post-project DSD levels are consistent with estimates or soil standards.

"Most of the harvest in the White Pine project area will be with skyline logging systems, so direct impacts to soil from machinery will be minimal and recovery will be relatively rapid." (Soil Report.) This illogically assumes that because DSD would occur over less areal extent, somehow the damage will recover more quickly. Where is the scientific basis for that?

It's also not clear if the amount of DSD attributable to temporary roads, swing trails and landings was included in activity area calculations, in conformance to R1 SQS methodology.

The arguments above call into question the clarity and consistency of the FS's White Pine analysis and show noncompliance with NEPA's mandates for taking a hard look at impacts, and properly analyzing and clearly disclosing them.

Additionally, due to the above stated reasons, the FS fails to properly demonstrate consistency with the only quantitative standards for soils, in violation of NFMA.

B. Flawed Soil Quality Standards.

Next we examine the FS's methods for assuring the perpetual maintenance of soil productivity, which is what NFMA requires. The agency relies upon Region 1 Soil Quality Standards (R1 SQS) and forest plan standards which have not been properly validated for NFMA compliance. We incorporate the previous section of the Objection within this section.

The Forest Plan's definition of "soil productivity" is instructive:

> The capacity of a soil to produce a specific crop such as fiber and forage, under defined levels of management. It is generally dependent on available soil moisture and nutrients and length of growing season.

Despite the Forest Plan definition's bias toward soils as mainly helping to produce lumber and beef, an implication for the myriad other resources[17] that depend upon healthy soils is clear: the

[17] "Soil is a critical component to nearly every ecosystem in the world, sustaining life in a variety of ways—from production of biomass to filtering, buffering and transformation of water and nutrients." Lacy, 2001.

FS's ability to sustain all forest resources should at least begin with an understanding of the ability of the soil for producing the agency's favorite "crops", given that its management of timber inevitably and repeatedly damages soils, perpetually maintaining them in a damaged state. Ye the FS has little accounting of the extent of the accumulated damage.

In discussing the R1 SQS, USDA Forest Service, 2016a explains that a major cumulative effect they ignore is the indirect effect of soil damage, or DSD, on sustained yield. It states that the Soil Standards "created the concept of 'Detrimental Soil Disturbance' (DSD) for National Forests in Region One as a measure to be used in assessing potential loss of soil productivity resulting from management activities." USDA Forest Service, 2016a further explains (emphases added):

> **Without maintaining land productivity, neither multiple use nor sustained (yield) can be supported by our National Forests**. Direct references to maintaining productivity are made in the Sustained Yield Act "…coordinated management of resources without impairment of the productivity of the land" and in the Forest and Rangeland Renewable Resources Act "…substantial and permanent impairment of productivity must be avoided".
>
> Soil quality is a more recent addition to Forest Service Standards. The Forest and Rangeland Renewable Resources Act (1974) appears to be the first legal reference made to protecting the "quality of the soil" in Forest Service directives. **Although the fundamental laws that directly govern policies of the U.S. Forest Service clearly indicate that land productivity must be preserved, increasingly references to land or soil productivity in Forest Service directives were being replaced by references to soil quality as though soil quality was a surrogate for maintaining land productivity. This was unfortunate, since although the two concepts are certainly related, they are not synonymous.**
>
> Our understanding of the relationship between soil productivity and soil quality has continued to evolve since 1974. Amendments to the Forest Service Manual, Chapter 2550 – Soil Management in 2009 and again to 2010 have helped provide some degree of clarity on this issue and acknowledged that **the relationship is not as simple as originally thought**. The 2009 (2500-2009-1) amendment to Chapter 2550 of the Forest Service Manual states in section 2550.43-5, directs the Washington Office Director of Watershed, Fish, Wildlife, Air and Rare plants to "Coordinate validation studies of soil quality criteria and indicators with Forest Service Research and Development staff to ensure soil quality measurements are appropriate to protect soil productivity" (USFS-FSM 2009). **Inadvertently this directive concedes that the relationship between soil productivity and soil quality is not completely understood.** In the end, the primary objective provided by National Laws and Directives relative to the management of Forest Service Lands continues to be to maintain and where possible potentially improve soil productivity. (Emphases added.)

USDA Forest Service, 2007 states:

> Sustained yield was defined in the Kootenai Forest Plan …as "the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the National Forest System without permanent impairment of the productivity of the land." Sustained yield is based on the lands' ability to produce.

That statement is on point: Since the FS has no idea how much soil has been permanently impaired either within the project area or forest-wide, "sustained yield" is an empty promise. We note that the FS's only quantitative measurement of soil conditions upon which its standards are based are, again, DSD. In other words, the FS is left depending upon data disclosing the amount of DSD, and upon standards limiting such damage. In other words, the FS adopted DSD as a proxy—a substitute—reductions in soil productivity caused by management. However, the FS doesn't cite any science as basis for explaining how its cap on activity area DSD to 15% corresponds to maintaining soil productivity in any meaningful ecological way.

Continual and repeated application of projects, hardly limited by the R1 SQS, will result in soils maintained at a damaged condition in perpetuity. The FS has no quantitative data or inventory of the continuous deficit of soil or land productivity. To the U.S. Department of Agriculture, accountability for losses of soil productivity on national forests is to be avoided.

Powers et al., 2005 explains:

> (T)rying to measure the productive potential of a site directly by assaying trends in tree or stand growth is fraught with frustrations and uncertainty. Growth trends in operational stands vary with stand age, structure, stocking and treatment history, and usually lack reference controls for comparison. Alternatively, soil-based indices of productive potential have been proposed as a more objective measure of a site's capacity for vegetative growth. The USDA Forest Service has adopted this approach and first approximation working standards are in place throughout the federal regions. **Meant as monitoring tools, these standards are presumed to reflect a site's potential, and to mark thresholds for significantly impaired productivity.** (Emphasis added; internal citations omitted.)

How and where these numerical thresholds are set is part of what we're questioning. The FS's favorite crop—trees—take decades to mature for harvest as lumber, and well over a century to collectively develop old-growth habitat character critical for the wildlife species discussed elsewhere in this objection.

Getting back to the origin of the 15% threshold the R1 SQS uses, there is another passage under the heading of **Scientific Uncertainty and Controversy** in the NPCNF's Johnson Bar FEIS:

> Defining the threshold at which productivity is detrimentally disturbed is controversial. The rationale for the 15% limit of change in soil bulk density was largely based on the collective judgment of soil researchers, academics, and field practitioners, and the accepted inability to detect changes in productivity less than 15% using current monitoring methods (Powers 1990). Powers (1990) states that

> the soil quality guidelines are set to detect a decline in potential productivity of at least 15%. This statement does not mean that the Forest Service tolerates productivity declines at this level, but that it recognizes problems with detection limits.

This sidesteps most of the controversy of FS assessment of soils—that the limitations of soil productivity measurements are not why the R1 SQS standards were set at 15%. The FS knows that the R-1 SQS limits are based on the fact that it is not feasible to do much less damage than 15% of an activity area while carrying out industrial logging. USDA Forest Service, 2008b states:

> The 15% change in aerial extent realizes that timber harvest and other uses of the land result in some impacts and impairment that are unavoidable. This limit is based largely on what is physically possible, while achieving other resource management objectives.

The R1 SQS were developed by the agency internally, without following the public processes such as Forest Planning, NEPA, or independent scientific peer review. In doing so, the FS obscures scientific and ecological deficiencies of the R1 SQS.

The FS chose 15% as its upper limit on soil damage within a unit merely because it believes that logging the merchantable trees and disposing of the slash often compacts or otherwise damages up to 15% of the areal extent of an "activity area." This limit has nothing to do with the science of maintaining soil productivity. In other places (USDA Forest Service, 2008b) the FS considers and discloses this fact.

Nesser, 2002 makes a distinction between the threshold for which soil compaction is considered to be detectable (15% increase in bulk density) and the 15% areal limit for detrimental disturbance, which is the R1 SQS upper limit on the sum of the various kinds of DSD:

> The 15% standard for increases in bulk density originated as the point at which we could reliably measure significant changes, considering natural variability in bulk density. It may or may not mean that a 15% increase in BD is detrimental. That may depend on the soil and ecosystem in which it is found. **(A)pplying the 15% areal limit for detrimental damage is not correct... (T)hat was never the intent of the 15% limit ...and NFMA does not say that we can create up to 15% detrimental conditions, it says basically that we cannot create significant or permanent impairment, period. How that works out in terms of practicality is the problem.** (Emphasis added.)

So we have the R1 SQS 15% areal extent limit being based on mere feasibility rather than concerns over soil productivity, and additionally we have the 15% bulk density increase limit based upon **the limitations of detection** of available soil compaction measurement methods—not detection of reductions in soil productivity itself. The FS's failure to disclose this is a violation of NEPA.

The Soil Report states, "The 5-year and ten-year results from the North American Long-Term Soil Productivity Study (LTSP) have been published (Powers et al., 2005; Page-Dumroese et al. 2006)." The FS has apparently abandoned its North American Long-Term Soil Productivity Study.

We also note that it doesn't matter how sensitive the soils, how steep the land, how poor the site is for growing trees, the varying aspects, the varying ratings of landslide or mass wasting potential, the varying ratings of erosion risk, the varying underlying geology, the varying presence of ash cap, the varying amounts of ground cover due to recent fire—the R1 SQS standard (15%) doesn't vary. This is consistent with its rigid basis in operational feasibility. Page-Dumroese et al., 2000 emphasize that utilization of such thresholds does not account for these real-world variables:

> Research information from short- or long-term research studies supporting the applicability of disturbance criteria is often lacking, or is available from a limited number of sites which have relative narrow climatic and soil ranges. …Application of selected USDA Forest Service standards indicate that **blanket threshold variables applied over disparate soils do not adequately account for nutrient distribution within the profile or forest floor depth. These types of guidelines should be continually refined to reflect pre-disturbance conditions and site-specific information.** (Emphasis added.)

To our knowledge, the refinement of the R1 SQS recommended by Page-Dumroese et al., 2000 has not occurred.

The Soil Report states, "None of the proposed units have high or very high hazard ratings for mass wasting, parent material erosion, or surface erosion." Yet there's no basis in the report for that statement.

The FS does not disclose that the SQS methodology for "activity areas" inherently encourages gerrymandering. For example, areas not previously logged or less impacted can be lumped into project "activity areas" diluting existing DSD and creating a lower average.

The R1 SQS and Forest Plan standards also fail to specifically address the sensitive nature of postfire soils—the operational limits/standards remain the same. And it doesn't matter if "High and moderate burn severity areas have 50 to 100 percent bare soil exposed; much of it with reduced capacity for water infiltration" (Johnson Bar FEIS) or "High severity – complete consumption of duff and mineral soil surface visibly reddish or orange color" (Woodrat EA). Instead of considering these areas to have DSD of 50-100%, the FS underestimates the DSD.

The FS does not properly distinguish between the issues of soil disturbance and soil productivity. Whereas soil disturbance measures physical signs of potential soil productivity losses, the FS's measures of soil disturbance do not necessarily provide scientifically valid and reliable measures of **soil productivity**—the latter being the focus of NFMA requirements.

The DSD limits are the only quantitative standards the agency recognizes for the purposes of complying with NFMA's substantive mandate to insure against irreversible losses in soil productivity. The Forest Management Handbook at FSH 2509.18 recognizes the need to validate the assumptions underlying the R1-SQS thresholds for soils disturbance. It directs the Forest Service to perform validation monitoring to "Determine if coefficients, S&Gs, and requirements meet regulations, goals and policy" (2.1 – Exhibit 01). It asks what we ask: "Are the threshold levels for soil compaction adequate for maintaining soil productivity? **Is allowing 15% of an area to be impaired appropriate to meet planning goals?**" (Emphasis added.)

A Forest Service scientific report (Grier et al., 1989) proposed a measure of soil productivity: "the total amount of plant material produced by a forest per unit area per year." They cite a study finding "a 43-percent reduction in seedling height growth in the Pacific Northwest on primary skid trails relative to uncompacted areas" for example. And in another Forest Service scientific report (Adams and Froehlich, 1981) states:

> Measurements of reduced tree and seedling growth on compacted soils show that significant impacts can and do occur. Seedling height growth has been most often studied, with reported growth reductions on compacted soils from throughout the U.S. ranging from about 5 to 50 per cent.

Your Lolo Insect and Disease FEIS admits, "Although soil recovery could still occur in remaining subsurface soils, the exceptionally high porosity and water-holding properties of the Mazama ash cap would likely be irrecoverable." However, the White Pine EA and Soil Report fail to quantify these irreversible and irretrievable soil losses in the project area or forestwide.

The Forest Plan includes Forest Plan Monitoring Requirement 11, requiring monitoring of "Site Productivity"[18] to be measured annually, and contains a "Research Need" to "Determine the effect of different fire intensities on basic soil fertility." Yet the EA and Soil Report don't cite any such monitoring or research.

USDA Forest Service 2014a discusses and discloses the complexities of fire and management-induced changes on soils:

> Management activities can result in both direct and indirect effects on soil resources. Direct and indirect effects may include alterations to physical, chemical, and/or biological properties. Physical properties of concern include structure, density, porosity, infiltration, permeability, water holding capacity, depth to water table, surface horizon thickness, and organic matter size, quantity, and distribution. Chemical properties include changes in nutrient cycling and availability. Biological concerns commonly include abundance, distribution, and productivity of the many plants, animals, microorganisms that live in and on the soil and organic detritus.

The R-1 SQS and definition of DSD consider alterations to physical properties, but not chemical or biological properties. The R-1 SQS does not adequately consider best available science, in

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[18] Defined in the Forest Plan as "Production capability of specific areas of land", which is similar to the definition of soil productivity.

violation of NEPA. One of these biological properties is partly represented by naturally occurring organic debris from dead trees. The R1 SQS recognize the importance of addressing potential long-term soil impacts due to losses of large woody debris, but include only discretionary guidelines to address the issue.

Some chemical properties are discussed in Harvey et al., 1994, including:

> The ...descriptions of microbial structures and processes suggest that they are likely to provide highly critical conduits for the input and movement of materials within soil and between the soil and the plant. Nitrogen and carbon have been mentioned and are probably the most important. Although the movement and cycling of many others are mediated by microbes, sulfur phosphorus, and iron compounds are important examples.
>
> The relation between forest soil microbes and N is striking. Virtually all N in eastside forest ecosystems is biologically fixed by microbes... Most forests, particularly in the inland West, are likely to be limited at some time during their development by supplies of plant-available N. Thus, to manage forest growth, we must manage the microbes that add most of the N and that make N available for subsequent plant uptake. (Internal citations omitted.)

Recent research reveals profound biological properties of forest soil ignored by the White Pine analysis: "(R)esource fluxes through ectomycorrhizal (EM) networks are sufficiently large in some cases to facilitate plant establishment and growth. Resource fluxes through EM networks may thus serve as a method for interactions and cross-scale feedbacks for development of communities, consistent with complex adaptive system theory." (Simard et al., 2015.) The FS has never considered how management-induced damage to EM networks causes site productivity reductions.

Amaranthus, Trappe, and Molina (in Perry, et al., 1989a) recognize "mycorrhizal fungus populations may serve as indicators of the health and vigor of other associated beneficial organisms. Mycorrhizae provide a biological substrate for other microbial processes."

Also:

> "The big trees were subsidizing the young ones through the fungal networks. Without this helping hand, most of the seedlings wouldn't make it." (Suzanne Simard: http://www.ecology.com/2012/10/08/trees-communicate/)
>
> "Disrupting network links by reducing diversity of mycorrhizal fungi… can reduce tree seedling survivorship or growth (Simard et al, 1997a; Teste et al., 2009), ultimately affecting recruitment of old-growth trees that provide habitat for cavity nesting birds and mammals and thus dispersed seed for future generations of trees." (Simard et al., 2013.) (Also see the YouTube video "Mother Tree" embedded within the Suzanne Simard "Trees Communicate" webpage at: https://www.youtube.com/watch?v=-8SORM4dYG8&feature=youtu.be) and also

> this one on the "Wood Wide Web" on Facebook: https://www.facebook.com/BBCRadio4/videos/2037295016289614/.

Gorzelak et al., 2015:

> …found that the behavioural changes in ectomycorrhizal plants depend on environmental cues, the identity of the plant neighbour and the characteristics of the (mycorrhizal network). The hierarchical integration of this phenomenon with other biological networks at broader scales in forest ecosystems, and the consequences we have observed when it is interrupted, indicate that underground "tree talk" is a foundational process in the complex adaptive nature of forest ecosystems.

Also see: "Trees Talk to Each Other in a Language We Can Learn, Ecologist Claims".

The scientists involved in research on ectomycorrhizal networks have discovered connectedness, communication, and cooperation between trees, traditionally viewed as separate competing organisms. Such connectedness is usually studied within single organisms, such as the interconnections in humans among neurons, sensory organs, glands, muscles, other organs, etc. necessary for individual survival. The tree farming mentality reflected in the White Pine project fails to consider the ecosystem impacts from industrial management activities on this mycorrhizal network—or even acknowledge they exist. This management paradigm will inevitably destroy what it refuses to see.

The R-1 SQS and EA do not adequately account for long-term losses in site or land productivity due to noxious weed infestations caused by management actions. The Sheep Creek Salvage FEIS (USDA Forest Service, 2005a) states at p. 173:

> Noxious weed presence may lead to physical and biological changes in soil. Organic matter distribution and nutrient flux may change dramatically with noxious weed invasion. Spotted knapweed (*Centaurea biebersteinii D.C.*) impacts phosphorus levels at sites (LeJeune and Seastedt, 2001) and can hinder growth of other species with allelopathic mechanism. Specific to spotted knapweed, these traits can ultimately limit native species' ability to compete and can have direct impacts on species diversity (Tyser and Key 1988, Ridenour and Callaway 2001).

USDA Forest Service, 2016a states, "Soil erosion or weed infestations are adverse indirect effects that can occur as a result any the above direct impacts. In both instances, serious land degradation can occur." The Soil Standards do not set any limitations on the total area that is infested by invasive plants in a project area at any given time, nor do they require disclosure of the extent of such weed invasions in a project area and the impacts such losses may have cumulatively on the Forest Service's ability to adequately restock the area within five years of harvest, as required by NFMA.

USDA Forest Service, 2015a indicates:

> Infestations of weeds can have wide-ranging effects. They can impact soil properties such as erosion rate, soil chemistry, organic matter content, and water infiltration. Noxious weed invasions can alter native plant communities and nutrient cycles, reduce wildlife and livestock forage, modify fire regimes, alter the effects of flood events, and influence other disturbance processes (S-16). As a result, values such as soil productivity, wildlife habitat, watershed stability, and water quality often deteriorate.

The FS has no idea how the productivity of the land been affected in the White Pine project area and forestwide due to noxious weed infestations, nor any trends. USDA Forest Service, 2005c states:

> Weed infestations are known to reduce productivity and that is why it is important to prevent new infestation sand to control known infestations. …Where infestations occur off the roads, we know that the **productivity of the land has been affected from the obvious vegetation changes**, and from the literature. The degree of change is not generally known. …(S)tudies show that productivity can be regained through weed control measures…

The FS does not cite the results or successes of weed control efforts. Nor is there any data considered regarding trends of invasive species, causes, and cumulative effects.

We are concerned about are invasive species, specifically on this ranger district, and it seems like, for a purpose and need of forest health, logging would ignore these issues. For example, Friends of the Clearwater did a BioBlitz on the Palouse Ranger District last fall--after the scoping period for this project, so this is new information that did not exist in 2018. FOC took observations of the species observed in what you have marked as "old growth," an area logged about twenty years ago, and an area logged within the past ten years. In the area logged within the past ten years, we found ventenata dubia, a noxious invasive grass that increases fire risk and has become a problem in the Pacific Northwest. We have included a brief report on ventenata in this area and the references cited, all in folder "Hoots 2020 Ventanata report." Please review and consider that. There is nothing in the EA that considers, addresses, or mitigates the establishment of ventenata. Given it is already in the Palouse Ranger District, we want to know how you plan to address that.

In focusing only on its flawed DSD proxy, the FS avoids quantifying losses in **soil productivity**, potentially leading to serious long-term reduction in growth of vegetation of all types, with resulting cascading impacts in food chains and ecosystem function.

C. DSD improvements improperly attributed to mitigation.

The FS does not disclose the analytical data that supports proposed soil mitigation/remediation measures. NEPA requires the FS to specify the effectiveness of its mitigations. (40 C.F.R. 1502.16.)

The FS does not cite studies or monitoring verifying that design criteria and mitigations it proposes have been tested and validated by the Clearwater NF, especially in relation to numerical cause-and-effect assessments of DSD.

Mitigation and restoration actions are not demonstrated to truly be effective in reducing DSD and restoring soil productivity within a short time frame.

Project documents reveal existing DSD along with White Pine project actions will cause cumulative predicted DSD to exceed the threshold of 15%. Yet the FS claims the DSD will be < 15% over some unspecified time frame because of mitigation. The FS also proposes to decompact decommissioned temporary roads. We note, however, the NPCNF's American River/Crooked River FEIS (USDA Forest Service, 2005d) states:

> **Decompaction** can at least **partly restore** soil porosity and productivity. Soil displacement that mixes or removes the volcanic ash surface layer reduces soil moisture holding capacity, which may be **irreversible and irretrievable**. (Emphasis added.)

The Soil Report states: "The greater disturbance associated with temporary road construction is the displacement or mixing of the topsoil during road excavation." Yet instead of accepting and disclosing that temporary road templates are forever DSD, the FS insists on claiming it isn't: "With the exception of permanent system road construction, the soil disturbance associated with the proposed action will not be irreversible, and unmitigated soil historic disturbances, such as excavated skid trails, will be improved."

"Road decommissioning has been effective in maintaining forest productivity (Lloyd et al, 2013)." (Soil Report.) This is a curious cite, given the study is about restoring—not maintaining—soil functioning. We also note that Lloyd et al., 2013 did not utilize a measure of DSD corresponding to the FS proxy when assessing effectiveness of restoration.

Of decompaction as a mitigation, USDA Forest Service, 2015a admits:

> ***Anticipated Effectiveness:*** Low to high. Many soil characteristics and operating decisions affect the outcomes of this feature. Forest plan monitoring has shown a 30-60 percent reduction in compaction as measured by bulk density of the soil.

USDA Forest Service, 2005b reports, "It is acknowledged that the effectiveness of soil restoration treatments may be low, often less than 50 percent." (P.3.5-20.)

USDA Forest Service, 2005b states, "Monitoring of winter-logging soil effects conducted by the Forest Soil Scientist on the Bitterroot National Forest over the past 14 years has shown that 58% of the ground-based, winter-logged units failed to meet the R1 SQS. Winter-logging resulted in an average of 16% detrimentally damaged soil." (P. 3.5-21.)

Forest Service Timber Sales Specialist Flatten, 2003 examines the practice of wintertime ground based logging and discusses what winter conditions provide the best protection for the soil resource. He points out the complexities and uncertainties of pulling off successful winter logging that effectively avoids of soil damage, which the FS does not consider. He concludes:

> The conditions necessary to provide protection of the soil resource during winter logging can be both complex and dynamic. Guidelines that take a simplified approach, though well understood during project planning, will likely become problematic once operations begin. The result may be inadequate soil protection or unnecessary constraints on operations. Winter logging guidelines should be developed that incorporate the latest research on snowpack strength and frozen soil and provide measurable criteria for determining when appropriate conditions exist.

USDA Forest Service, 2007c admits that soil displacement is essentially permanent anyway, despite restoration:

> Surface soil loss from roads through displacement and mixing with infertile substrata also has long lasting consequences for soil productivity because of the superiority of the volcanic ash surface layer over subsoils and substrata. (P. 4-76.)

NEPA requires the FS to specify the effectiveness of its mitigations. 40 C.F.R. 1502.16. The FS fails to specify the effectiveness of its mitigation of DSD. Given that consistency with the R1 SQS must be demonstrated by accurate estimates and measures of DSD, and that the FS claims the discretion to recognize no limits on amounts of activity area DSD after logging and before its "restoration" is implemented to supposedly nullify some percentage of that DSD, then any proof would have to be based upon quantitative, numerical measurements, not unsupported claims of improvement as found in project documents.

To be clear: we are not saying that mitigation and restoration are not effective to a degree. We are saying that the FS cannot attach specific DSD improvement percentages to its mitigation or restoration methodology. Given the critical role soils provide for the functioning of ecosystems—from the nutrients for the growing of trees and other vegetation that provides not only timber but habitat structure and forage for wildlife, filtering and holding of water, and native vegetation that resists invasive species—we firmly believe that the FS is recklessly risking soil productivity using vague, "the check's in the mail" mitigation and restoration. The FS isn't demonstrating consistency with forest plan soil standards or the R1 SQS, in violation of NFMA.

Ironically, with the FS demonizing the effects of natural processes throughout the EA (and using such characterizations as support for the project purpose and need) it is natural processes that are offered as the only reliable way to achieve soil recovery—but over an unspecified time period:

- "…time is allowed for recovery." (EA)
- "…the eventual recovery of soil productivity over time." (EA)
- "…soil recovery occurs over time" (Soil Report)
- "The soil productivity associated with temporary roads and skid trails will eventually be restored." (Soil Report)

But seriously, does anyone believe the FS won't want to be back into this project area with more tree farming, management meddling and associated new soil damage prior to the time it takes for natural recovery to mitigate the damage?

The FS certainly has no plans to monitor soil recovery. It only wants to see if the logging and burning activities violate the R1 SQS and Forest Plan long after anything can be done about it: "The time frame for monitoring soil property changes will be 3-5 years after proposed activities have been completed when an accurate assessment can be made (Gier, et al, 2018)." (Soil Report.)

Ultimately, managers refuse to face the fact that, as the Soil Scientist report states, "the effects due to soil loss from erosion or other displacement can be considered **permanent** for the disturbed site." (Emphasis added.)

After nearly thirty years of implementing the Forest Plan (which includes Forest Plan monitoring requirement 11), the agency cannot specify DSD improvement percentages to its management methodology.

Any FS implication that its management actions will result in specific amounts of net improvement in percentages of DSD is arbitrary and capricious. The FS cites no **quantitative** monitoring data that demonstrates that its restoration activities have taken an activity area with DSD amounts violating a standard to an amount that no longer violates a standard.

D. Failure to analyze and disclose the watershed level and cumulative implication of chronically compacted or otherwise detrimentally disturbed soils.

The FS's "analysis area" for soil productivity is individual treatment units and associated skid trails, landings, and temporary roads within the project area. Their logic is, there would be no indirect effects of damaged soils, outside those specific locations. And therefore certainly no cumulative effects from previously damaged soils, outside those specific locations. Yet the FS contracts what it writes in several other places. For example, from USDA Forest Service, 2008f:

> Many indirect effects are possible if soils are detrimentally-disturbed… Compaction can indirectly lead to decreased water infiltration rates, leading to increased overland flow and associated erosion and sediment delivery to stream. Increased overland flow also increases intensity of spring flooding, degrading stream morphological integrity and low summer flows.

But no matter how compacted the soils are outside the proposed individual treatment units and associated skid trails, landings, and temporary roads, the fact that reduced water infiltration in those other locations is contributing to increased water yield and erosion during storm events—so what? And if the previous logging in those other locations resulted in a paucity of legacy wood that, if present, would be incorporated into the soil and hold water and transmit nutrients for the next generation's timber stand—so what?

And if those previously disturbed areas outside the proposed individual treatment units and associated skid trails, landings, and temporary roads have become prime growing sites for noxious weeds—many species of which are well-adapted to disturbed sites and some of which actively inhibit native vegetation from recovering and therefore the sites exhibit reduced productivity—so what?

The FS fails to disclose how widespread project area DSD is, only focusing on the proposed individual treatments, in violation of NEPA. The FS fails to consider and use best available science, in violation of NFMA and additionally, NEPA's requirements for scientific integrity. *See* 36 C.F.R. 219.3; 40 C.F.R. 1502.24.

The NPCNF conducted such an analysis with the American River/Crooked River project FEIS (USDA Forest Service, 2005d), which stated:

> **Cumulative effects may also occur at the landscape level, where large areas of compacted and displaced soil affect vegetation dynamics, runoff, and water yield regimes in a subwatershed.** About 4,849 acres are currently estimated to have sustained detrimental compaction or displacement in the American River watershed due to logging, mining, or road construction. … About 4,526 acres are currently estimated to have sustained detrimental compaction or displacement in the Crooked River watershed due to logging, mining, and road or trail construction.

(Emphasis added.) USDA Forest Service, 2005d also disclosed:

> An estimated 73 percent (208) of past activity areas on FS lands in American River (and an estimated 69 percent (166) of past activity areas on FS lands in Crooked River) today would show detrimental soil disturbance in excess of 20 percent.
>
> American River (and most of Crooked River) is considered similar in soils and logging history to Red River, where 80 percent of sampled tractor logged activity areas did not meet Forest Plan standards. In many instances, these impacts occurred prior to forest plan implementation, but monitoring of more recent activities shows inconsistent improvement in practices. This degree of soil damage is consistent both with other Forest monitoring (USDA FS 1988a, 1990, 1992), and research (Krag, 1991; Froehlich, 1978; Davis, 1990, Alexander and Poff, 1985).
>
> Indirect effects of soil surface and substratum erosion include effects to vegetation and hydrologic processes.

The point is for the FS to account for <u>all</u> soil damage in a project area, including the cumulative effects of fire, past management, and other anthropogenic causes. We object to the FS's failure to incorporate the best available science and then disclose the full extent of soil restoration needs in these watersheds. USDA Forest Service, 2009c states, in regards to project area sites where DSD soils were **not** to be restored by active management: "For the …severely disturbed sites,… "no action" …would **create indirect negative impacts by missing an opportunity to actively restore damaged soils**. These sites would naturally recover in time, approximately 60 to 80 years." (Emphasis added.)

Again, much of this comes from FS's experts. The Bitterroot National Forest admits that subwatersheds which have high levels of existing soil damage could indicate a potential for hydrologic and silviculture concerns. (USDA Forest Service, 2005b, p. 3.5-11, 12.) The Idaho

Panhandle National Forests (USDA Forest Service, 2007c) acknowledge that soil conditions affect the overall hydrology of a watershed:

> Alteration of soil physical properties can result in loss of soil capacity to sustain native plant communities and reductions in storage and transmission of soil moisture that may affect water yield and stream sediment regimes. (P. 4-76, emphasis added.)

Nothing in the White Pine watershed analysis section specifically addresses the hydrological implications of the cumulative soil damage caused by past management added to timber sale-induced damage in project area watersheds. The FS fails to consider and use the best available science, in violation of NFMA and additionally, NEPA's requirements that the FS demonstrate scientific integrity. *See* 36 C.F.R. 219.3; 40 C.F.R. 1502.24.

USDA Forest Service, 2009c states:

> Compaction can decrease water infiltration rates, leading to increased overland flow and associated erosion and sediment delivery to streams. Compaction decreases gas exchange, which in turn degrades sub-surface biological activity and above-ground forest vitality. Rutting and displacement cause the same indirect effects as compaction and also channel water in an inappropriate fashion, increasing erosion potential.

Kuennen et al., 2000 (a collection of Forest Service soil scientists) state:

> An emerging soils issue is the cumulative effects of past logging on soil quality. Pre-project monitoring of existing soil conditions in western Montana is revealing that, where ground-based skidding and/or dozer-piling have occurred on the logged units, soil compaction and displacement still are evident in the upper soil horizons several decades after logging. Transecting these units documents that the degree of compaction is high enough to be considered detrimental, i.e., the soils now have a greater than 15% increase in bulk density compared with undisturbed soils. Associated tests of infiltration of water into the soil confirm negative soil impacts; the infiltration rates on these compacted soils are several-fold slower than rates on undisturbed soil.
>
> …**The effects of extensive areas of compacted and/or displaced soil in watersheds along with impacts from roads, fire, and other activities are cumulative.** A rapid assessment technique to evaluate soil conditions related to past logging in a watershed is based on a step-wise process of aerial photo interpretation, field verification of subsamples, development of a predictive model of expected soil conditions by timber stand, application of this model to each timber stand through GIS, and finally a GIS **summarization of the predicted soil conditions in the watershed.** This information can then be combined with an assessment of road and bank erosion conditions in the watershed to give a holistic description of watershed conditions and to help understand cause/effect

> relationships. **The information can be related to Region 1 Soil Quality Standards to determine if, on a watershed basis, soil conditions depart from these standards.** Watersheds that do depart from Soil Quality Standards can be flagged for more accurate and intensive field study during landscape level and project level assessments. **This process is essentially the application of Soil Quality Standards at the watershed scale with the intent of maintaining healthy watershed conditions**. (Emphases added.)

Kootenai National Forest hydrologist Johnson, 1995 noted this effect from his reading of the scientific literature: "Studies by Dennis Harr have consistently pointed out the effects of the compacted surfaces (roads, skid trails, landings, and firelines) on peak flows." Elevated peak flows harm streams and rivers by increasing both bedload and suspended sediment, which is not adequately analyzed in the FS's watershed analysis.

It is clear that the R1 SQS intend the FS to consider the cumulative effects of past and proposed soil disturbances to assure that soil productivity will be maintained. This includes impacts from activities that include logging, motorized vehicle use, livestock grazing, etc. Such cumulative effects analysis found in the Soil and Water Conservation Practices Handbook (FSH 2509.22), which states:

> Practice <u>11.01 – Determination of Cumulative Watershed Effects</u>
> OBJECTIVE: To determine the cumulative effects or impact on beneficial water uses by multiple land management activities. Past, present, or reasonably foreseeable future actions in a watershed are evaluated relative to natural or undisturbed conditions. Cumulative impacts are a change in beneficial water uses caused by the accumulation of individual impacts over time and space. Recovery does not occur before the next individual practice has begun.
>
> EXPLANATION: The Northern and Intermountain Regions will manage watersheds to avoid irreversible effects on the soil resource and to produce water of quality and quantity sufficient to maintain beneficial uses in compliance with State Water Quality Standards. Examples of potential cumulative effects are: 2) excess sediment production that may reduce fish habitat and other beneficial uses; 3) water temperature and nutrient increases that may affect beneficial uses; 4) compacted or disturbed soils that may cause site productivity loss and increased soil erosion; an 5) increased water yields and peak flows that may destabilize stream channel equilibrium.
>
> IMPLEMENTATION: As part of the NEPA process, the Forest Service will consider the potential cumulative effects of multiple land management activities in a watershed which may force the soil resource's capacity or the stream's physical or biological system beyond the ability to recover to near-natural conditions. A watershed cumulative effects feasibility analysis will be required of projects involving significant vegetation removal, prior to including them on implementation schedules, to ensure that the project, considered with other activities, will not increase sediment or water yields beyond or fishery habitat

> below acceptable limits. The Forest Plan will define these acceptable limits. The Forest Service will also coordinate and cooperate with States and private landowners in assessing cumulative effects in multiple ownership watersheds.

Booth, 1991 further explains the relationship between soil quality conditions and hydrology:

> Drainage systems consist of all of the elements of the landscape through which or over which water travels. These elements include the soil and the vegetation that grows on it, the geologic materials underlying that soil, the stream channels that carry water on the surface, and the zones where water is held in the soil and moves beneath the surface. Also included are any constructed elements including pipes and culverts, cleared and compacted land surfaces, and pavement and other impervious surfaces that are not able to absorb water at all.
>
> …The collection, movement, and storage of water through drainage basins characterize the hydrology of a region. Related systems, particularly the ever-changing shape of stream channels and the viability of plants and animals that live in those channels, can be very sensitive to the hydrologic processes occurring over these basins. Typically, these systems have evolved over hundreds of thousands of years under the prevailing hydrologic conditions; in turn, their stability often depends on the continued stability of those hydrologic conditions.
>
> Alteration of a natural drainage basin, either by the impact of forestry, agriculture, or urbanization, can impose dramatic changes in the movement and storage of water. …Flooding, channel erosion, landsliding, and destruction of aquatic habitat are some of the unanticipated changes that …result from these alterations.
>
> …Human activities accompanying development can have irreversible effects on drainage-basin hydrology, particularly where subsurface flow once predominated. Vegetation is cleared and the soil is stripped and compacted. Roads are installed, collecting surface and shallow subsurface water in continuous channels. …These changes produce measurable effects in the hydrologic response of a drainage basin.

The FS fails to consider and use the best available science, in violation of NFMA and additionally, NEPA's requirements for scientific integrity. *See* 36 C.F.R. 219.3; 40 C.F.R. 1502.24.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies identified above. Regarding the mitigation, “Where feasible, re-use existing skid trails and landings” maintain an inventory of such features as NFMA requires, since the FS proposes to keep them as permanent disturbances upon the land.

GRIZZLY BEAR

Our January 7, 2019 comment letter mentioned Threatened species on the first page. The White Pine EA does not contain analysis for the Canada lynx. In fact, it has no discussion whatsoever for Sensitive terrestrial animals.

We incorporate our discussion on the grizzly bear from our comments on the Draft Forest Plan and EIS (pp. 193-209).

Since there is solid documentation of recent and ongoing grizzly bear occupancy in the Bitterroot National Forest[19], and with recent documented sightings on the NPCNF, grizzly bear residency should be considered permanent. Formal consultation on the Forest Plan is out of date. Formal consultation with the FWS is needed for this project.

In updating the consultation on forest plan impacts on grizzly bears, the FS should be identifying key habitat components for grizzly bears for prioritizing road density reductions (Proctor, et al., 2020) so populations can recover.

Schwartz et al. (2010) noted that management for grizzly bears requires provisions for security areas and limits of road densities between security areas. Otherwise, grizzly bear mortality risks will be high as bears attempt to move across highly roaded landscapes to other security areas. The forest plan lacks direction regarding road densities located outside of and between security areas.

The FS is aware of the best programmatic agency direction it has adopted to date, that established in Flathead Forest Plan Amendment 19.[20] It established Open Motorized Route Density (OMRD)/Total Motorized Route Density (TMRD)/Security Core indices. These are based upon the scientific information concerning security from roads and road density requirements for grizzly bears as found in Mace and Manley, 1993 and Mace et al., 1996.

Remedy: Select the No Action Alternative. Otherwise, prepare an EIS which addresses the issues identified above and in our DFP comments, including formal consultation with the U.S. Fish & Wildlife Service.

[19] See newspaper articles "Wandering grizzly leaves Bitterroot, returns to Idaho" (https://helenair.com/news/state-and-regional/wandering-grizzly-leaves-bitterroot-returns-to-idaho/article_9dfe0e30-b6da-5671-9f77-3f2eac4a9c6c.html#tracking-source=home-the-latest) and "Grizzly bear captured Saturday at golf course near Stevensville" (https://ravallirepublic.com/news/local/article_10f3f415-9cc5-5df4-91f8-2bc045650fdc.html).

[20] Although that Forest Plan has been revised and the Amendment 19 direction dropped and/or weakened, Alliance for the Wild Rockies has objected to the Flathead NF's revised forest plan and filed notice on their intent to sue on this issue.

SENSITIVE PLANTS

Our October 29, 2018 comment letter stated, "There is no rationale given for logging in riparian areas, other than some assertion that some riparian areas are departed from natural conditions. No details are provided. There is no indication of what rare species may inhabit the riparian areas."

The EA states that project activities could potentially cause "the potential for some short term, localized declines" but no real quantitative analysis was included.

The EA states, "Forest personnel have surveyed large portions of the project area for the presence of sensitive plant species and determination of suitable habitats." However this does not say a botanist qualified to identify Sensitive species did the surveys.

Regarding *Cypripedium fasciculatum* (Clustered lady's-slipper), the EA states:

> While some plants may be affected by management activities, protective measure will be included to protect occurrences of the species that are important to the viability of the overall population. Specific actions may involve avoidance, adjustments in unit boundaries or systems, and other measures determined in planning or layout as being necessary and effective. Similar efforts were implemented as part of the last project in this area and surveys revealed those efforts were successful in maintaining a healthy population.

The EA doesn't say whether all the sensitive plant populations mentioned in the EA or the White Pine Timber Sale FEIS were surveyed, to determine population trends or to verify FEIS analyses. There is also no indication whether White Pine I had the impact predicted on this species, or whether they still exist in the areas they did before the first White Pine project (White Pine I).

In addition, that FEIS and/or this EA indicate Sensitive plant species other than *Cypripedium fasciculatum* exist in the project area [*Blechnum spicant* (Deerfern)] or are suspected [*Botrychium minganense* (Mingan moonwort), *Botrychium montanum* (Mountain moonwort), *Botrychium pinnatum* (Northern moonwort), *Botrychium simplex* (Least moonwort), *Buxbaumia viridis* (Green bug-on-a-stick), *Rhizomnium nudum* (Naked Rhizomnium), *Trientalis latifolia* (Western Starflower) and *Rubus spectabilis* (Salmonberry).] Apparently the FS did not survey suitable habitat for these species' presence either. Viability of Sensitive plant species becomes more and more tenuous with each industrial management action. The EA does not adequately analyze cumulative effects.

Remedy: Select the no action alternative. Alternatively, conduct surveys of potential sites during the proper season to be able to document presence of Sensitive plants known or suspected to be in the project area, and include a proper cumulative effects analysis in an Environmental Impact Statement.

SCIENTIFIC INTEGRITY

Since there was no EA comment period, this is the first opportunity for the public to review the scientific and procedural veracity of the FS's analyses.

The FS has not disclosed the statistical reliability of the data the FS relies upon for the White Pine project analysis. Since "an instrument's data must be reliable if they are valid" (Huck, 2000) this means data input to a model must accurately measure that aspect of the world it is claimed to measure, or else the data is invalid for use by that model. Also, Beck and Suring, 2011 "remind practitioners that if available data are poor quality or fail to adequately describe variables critical to the habitat requirements of a species, then only poor quality outputs will result. Thus, obtaining quality input data is paramount in modeling activities." And Larson et al. 2011 state: "Although the presence of sampling error in habitat attribute data gathered in the field is well known, the measurement error associated with remotely sensed data and other GIS databases may not be as widely appreciated."

Huck, 2000 states:

> The basic idea of reliability is summed up by the word consistency. Researchers can and do evaluate the reliability of their instruments from different perspectives, but the basic question that cuts across these various perspectives (and techniques) is always the same: "To what extent can we say the data are consistent?" …(T)he notion of consistency is at the heart of the matter in each case.
>
> …(R)eliability is conceptually and computationally connected to the data produced by the use of a measuring instrument, not to the measuring instrument as it sits on the shelf.

During litigation of a timber sale on the Kootenai NF (CV-02-200-M-LBE, Federal Defendants Response to Motion for Preliminary Injunction), the FS criticized a report provided by plaintiffs, stating "(Its) purported 'statistical analysis' reports no confidence intervals, standard deviations or standard errors in association with its conclusions."

As Huck (2000) states, the issue of "standard deviations or standard errors" that the FS raised in the context of that litigation relates to the reliability of the data, which in turn depends upon how well-trained the data-gatherers are with their measuring tools and measuring methodology. In other words, different measurements of the same phenomenon must result in numbers that are very similar to result in small "standard deviations or standard errors" and thus high reliability coefficients, which in turn provide the public and decisionmakers with an idea of how confident they can be in the conclusions drawn from the data.

The analysis methodology rely heavily upon the assumption that the FS knows the "historic conditions" as is stated in the EA, e.g.: "species composition is departed from historic conditions." Yet the reliability of the data sources used to construct the EA's "historic conditions" is not disclosed. The data sources themselves are not identified or obscure.

The U.S. Department of Agriculture document, "USDA-Objectivity of Statistical and Financial Information" is instructional on this topic.

The next level of scientific integrity is the notion of "validity." So even if FS data input to its models are reliable, a question remains of the analysis and modeling methodology validity. In other words, are the models scientifically appropriate for the uses for which the FS is utilizing them? As Huck, (2000) explains, the degree of "content validity," or accuracy of the model or methodology is established by utilizing other experts. This, in turn, demonstrates the necessity for utilizing the peer review process. The FS has not disclosed the limitations of all models the FS relies upon for the White Pine project analyses, which begins to address model validity.

The Nez Perce Forest Plan includes a requirement for the FS to validate the models it uses. In Chapter V, the Forest Plan monitoring plan notes a "NFMA Requirement 36 CFR 219.12(K)(2)" and the "Action() …" is "Validation of resource prediction models; wildlife, water quality, fisheries, timber."

Model results can be no better than as the data fed into them, which is why data reliability is discussed above. The Ninth Circuit Court of Appeals has declared that the FS must disclose the limitations of its models in order to comply with NEPA. The FS has failed to disclose these limitations. Unfortunately, the FS uses models without any real indication as to how much they truly reflect reality.

In the Clear Creek Integrated Restoration Project FEIS, the NPCNF defines "model" as "a theoretical projection in detail of a possible system of natural resource relationships. A simulation based on an empirical calculation to set potential or outputs of a proposed action or actions." (FEIS at 5-14.) From www.thefreedictionary.com:

> Empirical – 1. a. Relying on or derived from observation **or** experiment: empirical results that supported the hypothesis. b. Verifiable or provable by means of observation or experiment: empirical laws. 2. Guided by practical experience and not theory, especially in medicine.

(Emphasis added.) So models are "theoretical" in nature and the agency implies that they are somehow based in observation or experiment that support the hypotheses of the models. That would be required, because as Verbyla and Litaitis (1989) assert, "Any approach to ecological modelling has little merit if the predictions cannot be, or are not, assessed for their accuracy using independent data." This corresponds directly to the concept of "**validity**" as discussed by Huck, 2000: "(A) measuring instrument is valid to the extent that it measures what it purports to measure."

However, there is no evidence that the FS has performed validation of any the models for the way they were used to support the EA's analyses. There is no documentation of someone using observation or experiment to support the model hypotheses.

As Huck, (2000) explains, the degree of "content validity," or accuracy of the model or methodology is established by utilizing other experts. This, in turn, demonstrates the necessity for utilizing the peer review process. The validity of the various models utilized in the EA's analyses have, by and large, not been established for how agency utilizes them. No studies are cited which establishes their content validity, and no independent expert peer review process of the models has occurred.

Larson et al. 2011 state:

> Habitat models are developed to satisfy a variety of objectives. ...A basic objective of most habitat models is to predict some aspect of a wildlife population (e.g., presence, density, survival), so assessing predictive ability is a critical component of model validation. **This requires wildlife-use data that are independent of those from which the model was developed.** ...It is informative not only to evaluate model predictions with new observations from the original study site but also to evaluate predictions in new geographic areas.

(Internal citations omitted, emphasis added). A FS forest plan monitoring and evaluation report provides an example of the agency itself acknowledging the problems of data that is old and incomplete, leading to the limitation of models the FS typically uses for wildlife analyses for old-growth wildlife habitats:

> Habitat modeling based on the timber stand database has its limitations: the data are, on average, 15 years old; canopy closure estimates are inaccurate; and data do not exist for the abundance or distribution of snags or down woody material… .

(USDA Forest Service, 2000c.) In that case, the FS expert believed the data were unreliable, so the usefulness or applicability of the model—its validity—is limited.

USDA Forest Service 1994b states "It is important to realize that all models greatly simplify complex processes and that the numbers generated by these models should be interpreted in light of field observations and professional judgement." (III-77.)

Beck and Suring, 2011 state:

> Developers of frameworks have consistently attained scientific credibility through published manuscripts describing the development or applications of models developed within their frameworks, but a major weakness for many frameworks continues to be a lack of validation. Model validation is critical so that models developed within any framework can be used with confidence. Therefore, we recommend that models be validated through independent field study or by reserving some data used in model development.

Larson et al. 2011 state:

> (T)he scale at which land management objectives are most relevant, often the landscape, is also the most relevant scale at which to evaluate model performance. Model validity, however, is currently limited by a lack of information about the

spatial components of wildlife habitat (e.g., minimum patch size) and relationships between habitat quality and landscape indices (Li et al. 2000).

Beck and Suring, 2011 developed several criteria for rating modeling frameworks—that is, evaluating their validity. Three of their criteria are especially relevant to this discussion:

Habitat–population linkage	Does the modeling framework incorporate vital rates (e.g., production, survival), other demographic parameters (e.g., density, population size); surrogates (e.g., quality of home ranges, habitat conditions in critical reproductive habitats, presence/absence) of population demographic parameters; or does the modeling framework model habitat conditions without specific consideration of wildlife population parameters?	0 = does not rely on population demographics or surrogates of modeled species 1 = relies on surrogates for population demographic parameters or framework; can utilize population demographics if desired, but is not dependent on them 2 = specifically relies on population demographics of modeled species
Scientific credibility	Has the framework gained credibility through publication of results, application of results, or other mechanisms to suggest acceptance by an array of professionals?	0 = limited credibility 1 = at least 1 publication of results using this framework, or other application of the modeling framework
Output definition	Is the output well defined and will it translate to something that can be measured?	1 = difficult 2 = moderate 3 = easy

The documents, "USDA-Objectivity of Regulatory Information" and "USDA-Objectivity of Scientific Research Information" are instructional on this topic.

Ruggiero, 2007 (a scientist from the research branch of the FS) recognizes a fundamental need to demonstrate the proper use of scientific information, in order to overcome issues of decisionmaking integrity that arise from bureaucratic inertia and political influence. Ruggiero, 2007 and Sullivan et al., 2006 provide a commentary on the scientific integrity and agency use and misuse of science. And the Committee of Scientists (1999) recommend "independent scientific review of proposed conservation strategies…" The interpretation of scientific information the analyses do cite is problematic as we discuss throughout this objection. A big problem is that scientific information we cited in our comments on the PA was ignored or dismissed without discussion.

The EA violates NEPA because the FS has not insured the reliability of data relied upon by the EA's models, the FS has not validated the models for the way the EA utilizes them, and the FS has overly narrowed the information it considers to be best available science.

Roger Sedjo, member of the Committee of Scientists, expresses his concerns in Appendix A of their 1999 Report about the discrepancy between forest plans and Congressional allocations, leading to issues not considered in forest plans:

> (A)s currently structured there are essentially two independent planning processes in operation for the management of the National Forest System: forest planning as called for in the legislation; and the Congressional budgeting process, which budgets on a project basis. The major problem is that there are essentially two independent planning processes occurring simultaneously: one involving the creation of individual forest plans and a second that involves congressionally authorized appropriations for the Forest Service. Congressional funding for the Forest Service is on the basis of programs, rather than plans, which bear little or no relation to the forest plans generated by the planning process. There is little evidence that forest plans have been seriously considered in recent years when the budget is being formulated. Also, the total budget appropriated by the Congress is typically less than what is required to finance forest plans. Furthermore, the Forest Service is limited in its ability to reallocate funds within the budget to activities not specifically designated. Thus, the budget process commonly provides fewer resources than anticipated by the forest plan and often also negates the "balance" across activities that have carefully been crafted into forest plans. Balance is a requisite part of any meaningful plan. Finally, as noted by the GAO Report (1997), fundamental problems abound in the implementation of the planning process as an effective decision making instrument. Plans without corresponding budgets cannot be implemented. Thus forest plans are poorly and weakly implemented at best. Major reforms need to be implemented to coordinate and unify the budget process.

A Science Consistency Review is long overdue for the revised Forest Plan (See Guldin et al., 2003, 2003b). The FS prepared Guldin et al. (2003) which:

> ...outlines a process called the science consistency review, which can be used to evaluate the use of scientific information in land management decisions. Developed with specific reference to land management decisions in the U.S. Department of Agriculture Forest Service, the process involves assembling a team of reviewers under a review administrator to constructively criticize draft analysis and decision documents. Reviews are then forwarded to the responsible official, whose team of technical experts may revise the draft documents in response to reviewer concerns. The process is designed to proceed iteratively until reviewers are satisfied that key elements are **consistent with available scientific information.**

Darimont, et al., 2018 advocate for more transparency in the context of government conclusions about wildlife populations, stating:

> Increased scrutiny could pressure governments to present wildlife data and policies crafted by incorporating key components of science: transparent methods, reliable estimates (and their associated uncertainties), and intelligible decisions emerging from both of them. Minimally, **if it is accepted that governments may always draw on politics, new oversight by scientists would**

> **allow clearer demarcation between where the population data begin and end in policy formation** (Creel et al. 2016*b*; Mitchell et al. 2016). Undeniably, social dimensions of management (i.e., impacts on livelihoods and human– wildlife conflict) will remain important. (Emphasis added.)

In a news release accompanying the release of that paper, the lead author states:

> In a post-truth world, **qualified scientists are arm's length now have the opportunity and responsibility to scrutinize government wildlife policies and the data underlying them.** Such scrutiny could support transparent, adaptive, and ultimately trustworthy policy that could be generated and defended by governments. (Emphasis added.)

The Committee of Scientists (1999) state:

> To ensure the development of scientifically credible conservation strategies, the Committee recommends a process that includes (1) scientific involvement in the selection of focal species, in the development of measures of species viability and ecological integrity, and in the definition of key elements of conservation strategies; (2) independent scientific review of proposed conservation strategies before plans are published; (3) scientific involvement in designing monitoring protocols and adaptive management; and (4) a national scientific committee to advise the Chief of the Forest Service on scientific issues in assessment and planning.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the analytical and scientific issues identified above.

INSUFFICIENT ANALYSIS OF EFFECTS ON AQUATIC SPECIES, RIPARIAN AREAS, AND WATER QUALITY

Our comments expressed concern with White Pine Project impacts on watersheds and aquatics. We noted that there is no rationale given for vegetation manipulation in riparian areas other than an assertion that some riparian areas are "departed" from their natural conditions, without more detail. We noted that there is no indication of what rare species might inhabit the area. We also specifically asked for an alternative not to manage within RHCAs or to use the default buffers at the very least. This is also the first we've seen as to how the Forest Service is analyzing water/fisheries resources, and we have identified issues with this analysis.

The Water Resources Report states, "The White Pine project area encompasses 7,027 acres, and is located within two United States Geological Survey (USGS) Hydrologic Unit Code 12 (HUC12) subwatersheds: Headwaters Hangman Creek (HUC12 #170103060101) and Meadow Creek (HUC12 #170601080103)."

The Fisheries Specialist Report states, "Of the special status aquatic species addressed in this report (see Table 2), only native redband trout and western pearlshell mussel, and introduced brook trout are definitely currently present within the White Pine project area. …Redband …are present in the Hangman Creek drainage…" And the Water Resources Report states "Redband trout are present in the Headwaters Hangman Creek subwatershed and are considered to be a 'conservation population.'"

"The population of redband trout present in the upper Hangman Creek drainage is considered a "Conservation Population" because of its relatively high genetic purity (Interior Redband Conservation Team 2016)." (Fisheries Specialist Report.)

Forest Plan Standards and Appendix K

The Clearwater National Forest's 1997 White Pine Timber Sale FEIS states:

> While the Forest Service manages 42 percent of the watershed, only three percent of the stream length (.3 miles) is on National Forest system lands. **Meadow Creek does not meet Forest Plan standard**s due to past timber harvest, road related activities, cattle and sheep grazing, and historic settlement.
>
> **Blakes Fork does not meet Forest Plan standards**, but is below its estimated channel stability (geomorphic) threshold. Direct observations by Michael Philbin and instream monitoring (Table III-18) found that Blakes Fork has recovered from past disturbances, but its inherent properties (a mobile, small gravel substrate) make this **a very sensitive stream bordering on instability**.

(Emphases added.) Now, we have the White Pine EA, which does not even mention these forest plan standards, so naturally it doesn't demonstrate compliance. The EA does talk about state of Idaho standards:

> Meadow Creek is supporting its beneficial uses; however, Hangman Creek is listed as water quality impaired for temperature, sediment, and bacteria in the 2014 IDEQ 303(d)/305(b) Integrated Report (IDEQ 2017), and an approved total maximum daily load (TMDL) has been developed by IDEQ (IDEQ 2007).[21]

But it's not until the end of the Fisheries Specialist Report when the subject of those forest plan standards the FS was not managing consistently with in 1997. Unfortunately, the situation is still bad:

> The streams in the project area are currently (as best as can be told from available data and professional judgment) are far from meeting the standards for cobble embeddedness. Cobble embeddedness figures measured for the Blakes Fork and Meadow Creek reaches shown in Appendices B and C are essentially double the 40-45% desired future condition for this metric (Table 5). The 2018 CE values for the Blakes Fork are also well above the measurements made in the two 1990s surveys.

[21] The FS also doesn't demonstrate the project would not exceed TMDL allowances for pollutants and conform to state standards and therefore the Clean Water Act.

> … Taking the 2018 cobble embeddedness data at face value, the desired standards for fine sediment/CE were not being met in 2018.

So why—after 33 years of Forest Plan implementation, and 25 years after the Forest Plan was amended by PACFISH and INFISH—are these streams still not meeting the standards? The EA and specialists' reports don't have the cumulative effects analyses to even speculate on this situation.

The Fisheries Specialist Report glosses over this dour situation, concluding that more management-induced sediment won't be at all significant (citing the Water Resources Report): "(Traeumer and Hovde 2019), however, make the determination that the propose action would cause no measurable increase in sediment production, so the project meets the terms of the Stipulation Agreement."

The FS completely obfuscates the issue in claiming that project-induced sediment won't be "measurable" without explaining what that means—who measures, how they measure, when they measure, what they measure, what's the threshold for significance… It's just "immeasurable"—so claims the agency.

In reality, the FS has no intention of measuring project induced sediment. Nothing in the proposed monitoring section proposes to measure sediment. In fact, the word "monitor" doesn't even appear in the EA or Decision Notice.

USDA Forest Service, 2006c states:

> Increasing sediment production is generally associated with ground based harvest systems and particularly road construction. Sediment decreases habitat diversity, degrades spawning and rearing habitat and consequently fish reproduction and survival. It also reduces aquatic insect production. The density of salmonids in rearing habitat has been shown to be inversely proportional to the level of fine sediment (Bjornn and Reiser 1991). Fine sediment can greatly reduce the capability of winter and summer rearing habitats and when levels reach 30% or more, survival to emergence is significantly reduced (Shepard et al. 1984). Fine sediment may have the greatest impact on winter rearing habitat for juvenile salmonids. Fine sediments can cap or fill interstitial spaces of streambed cobbles. When interstitial rearing space is unavailable, juvenile salmonids migrate until suitable wintering habitat can be found (Muhlfeld 2001). Fine sediment has also been shown to cause alterations in macroinvertebrate abundance and diversity.

Ongoing and proposed activities will deliver sediment into stream networks. Sediment in streams degrades native fish habitat by filling in interstitial spaces and pools, and decreasing inter-gravel dissolved oxygen concentrations. Deposited sediments harm native fish directly by smothering eggs in redds, altering spawning habitat, and reducing overwintering habitat for fry, and indirectly by altering invertebrate species composition, thereby decreasing abundance of preferred prey.

The Fisheries Specialist Report admits, "Because the road reconstruction and decommissioning would not necessarily be coincident or shortly following vegetation manipulation and road construction/reconstruction, it cannot be said that the proposed action would result in a net reduction in sediment production in the project area for the proposed action."

What the FS does is <u>model</u> estimated project sediment yield. The Water Resources Report states:

> *Sediment Yield Percent Over Base*
> WEPP predictions of average annual sediment delivery the first year post-activity for proposed harvest, activity fuels, constructed new system road and constructed temporary roads, reconstructed existing system roads and reconstructed existing temporary roads, and prescribed fire (outside of RHCAs) range from 0.004 to 0.322 tons/acre/year, with the probability (or percent chance) of predicted sediment delivery occurring the first year post-activity ranging from 27 to 100%. WEPP predictions of average annual sediment delivery the first year post-activity for prescribed fire occurring in RHCAs within 15 feet of intermittent streams and 25 feet of perennial streams range do not exceed 0.004 tons/acre/year, with the probability of sediment delivery occurring the first year post-prescribed fire within RHCAs ranging from 20 to 23%. WEPP predictions of sediment delivery reflect the influence of large storm events in WEPP simulations and results. These large events, while predicted to generate runoff volumes that could deliver sediment through an RHCA, are infrequent and have a low probability of occurring; however, they are included in WEPP's calculation of average annual sediment delivery.
>
> Sediment delivery less than 0.50 tons/acre/year is considered immeasurable and negligible (W. Elliott, USFS Rocky Mountain Research Station, personal communication September 7, 2018) (Elliot and Miller 2004, Covert 2003). As average annual sediment delivery predictions from the proposed action are less than 0.50 tons/acre/yr, it can be concluded that potential sediment delivery from the proposed activities would be immeasurable, and therefore would have no to negligible effects on water resources.

Observe that nothing in the above analysis actually refers to sediment going into any particular stream, from any particular source. The analysis remains totally vague. Also, what is your basis for concluding additional sediment to be negligible when identified pollutants, e.g., for Blakes Fork (1997 White Pine EIS Ch. II, p. 7) includes sediment?

The EA doesn't disclose the existing conditions of site specific stream reaches and project effects on water quality, fish and other aquatic resources. The EA doesn't disclose information regarding the existence and effects of bedload and accumulated sediment. The EA doesn't analyze and disclose channel stability for specific stream reaches. The EA doesn't disclose the amount of existing accumulated fine and bedload sediment that remains from the previous logging and road construction.

The FS doesn't take a hard look at the condition of all streams and water bodies in the affected watersheds, and explain how those conditions contribute to fish population and trends. The FS doesn't disclose populations of fish species in the project area, and compare those numbers to minimum viable populations.

The Fisheries Specialist Report indicates why analyses of smaller headwater streams, largely no done with this project analysis, is important: "The mainstem of Meadow Creek is mostly on private land and so, with the exception of about 2,500 feet of channel, is not within the project area, but this creek is the largest stream on the project area and is affected by conditions transmitted from the three tributary streams discussed above."

King, 1994 explains that small headwaters areas are particularly sensitive to the increased water yields due to removal of tree canopy:

> Timber removal on 25-37% of the area of small headwater watersheds increased annual water yield by an average of 14.1 inches, prorated to the area in harvest units and roads. Increases in streamflow occurred during the spring snowmelt period, especially during the rising portion of the snowmelt hydrograph. These forest practices also resulted in large increases in short duration peakflows, greatly increasing the sediment transport capacity of these small streams. The cumulative effects of these activities on streamflow in the Main Fork, with only 6.3% of its area in roads and harvest units, were not detectable.

Ziemer, 1998 observed the same phenomenon in his study on flooding and stormflows. Also, King, 1989 observed that "Current procedures for estimating the hydrologic responses to timber removal of third to fifth order streams often ignore what may be hydrologically important modifications in the low-order streams."

Headwater streams and non-fish bearing streams need more, not less, protection (Rhodes et al., 1994; Moyle et al., 1996; Erman et al., 1996; Espinosa et al., 1997). Both Erman et al., 1996 and Rhodes et al., 1994 conclude, based on review of available information, that intermittent and non-fish-bearing streams should receive stream buffers significantly larger than those afforded by PACFISH/ INFISH.

The Fisheries Specialist Report states, "Summary. Effects of the proposed action alternatives on brook trout in the project area should be limited to possible temporary and site-specific impacts related to road decommissioning, reconstruction, culvert replacement, and **hauling**, and unauthorized trail decommissioning." (Emphasis added.) Whether the modeling utilized is accurate or not, nothing in the specialists reports or EA analyze or disclose the fact that log hauling and other uses of roads substantially increases sediment yields into water. This is even admitted in the NPCNF's Johnson Bar FEIS. We further discuss the issue of road use sediment in the section of this Objection entitled Travel Management, wherein we cite the Johnson Bar FEIS and credible scientific sources.

The Water Resources Report states:

> **At best**, any predicted runoff or erosion value would be within **plus or minus 50% of the true value**. Erosion rates are highly variable, and most models can predict only a single value. Replicated research has shown that observed values vary widely for identical plots, or the same plot from year to year (Elliot et al. 1995; Tysdal et al. 1999). Additionally, spatial variability and variability of soil properties add to the complexity of erosion prediction (Robichaud 1996). (Emphases added.)

And yet the FS relies upon those unreliable modeling results to claim "no significant effects." Arbitrary and capricious.

USDA Forest Service 1994b states "It is important to realize that all models greatly simplify complex processes and that the numbers generated by these models should be interpreted in light of field observations and professional judgement." (III-77.) Harr, 1987 states:

> Perhaps the most basic of the erroneous beliefs is the idea that <u>simplicity can be willed on the forest hydrologic system</u>. This belief encourages the implementation of simplistic guidelines, the adoption of arbitrary thresholds of concern, and the search for all-encompassing methodologies to predict consequences of forest activities on water resources. These actions occur sometimes with the blessings of hydrologists or soil scientists but other times over their objections. The belief in simplicity has been nurtured by the rapid increase in the use of computer simulation models in forest planning and the desire to accept the output from such models. Another reason for pursuit of simplicity is the current emphasis on planning called for by NFMA; such planning is often conducted under strict time and budgetary constraints.
>
> I must point out that, on the average, the simplistic methodologies may have resulted in fairly prudent forest management. But rather than being viewed as merely a first attempt at solving a problem, they often seem to inhibit further investigation and development. Also, they tend to lead forest managers and some specialists to believe that hydrologic systems really do function in the manner described by the simplistic methodologies.
>
> Forest hydrologic systems are more complex than one would believe after reading some of the methodologies and procedures that have been proposed to predict cumulative effects of logging on water resources. For example, many of these procedures state that a threshold of harvest activity or intensity will be determined, without specifying how it will be determined or whether it really exists or can be measured. Similarly, implementing a methodology for estimating cumulative effects of harvest operations on water resources does not mean that such cumulative effects either exist or can be measured.
>
> (I)n our desire to simplify, to create a methodology that will predict consequences of harvest activities everywhere or in the average situation, we usually expend considerable energy creating a methodology that predicts reasonably accurately

> virtually nowhere. We may implement procedures without providing for testing or monitoring the results to see whether the procedures are, in fact, working. In the process, we may even develop a false sense of security that our methodology can really protect soil and water resources.

Analysis for the White Pine Project acknowledges that proposed actions that could affect water resources include vegetation treatments, fuels treatments, temporary road construction, temporary road reconstruction on existing road templates, new system road construction, existing system road maintenance and reconstruction, and culvert replacements.

The conclusion that there will be no measurable increase in sediment is not supported by facts. PACFISH/INFISH buffers cannot stop the sedimentation once it inters the stream, and skid trails, landings, and temporary roads link to existing roads and ditches, where runoff goes down the ditch to a culvert and is conducted into small streams, which carry sediment into larger streams. Below is an illustration of this; the hillside ditch of the road is filled with fine sediment. It was taken on the Clearwater National Forest in the Lowell WUI project in 2018 (before the road in this exact same area was blown out from a landslide).

At center-top-third of this picture is a culvert, which you can't see because of the sediment. Below is a detail shot of the above picture where the culvert is.

FS hydrologist Johnson (1995) points out older roads feature ditches on the inside of the road which greatly increases drainage efficiency, causing peak flows to go far beyond any modeled predictions.

The sediment surrounding the culvert is abundant. If one were to walk to what is depicted on at the top of the above picture and turn around to take a picture of the culvert, the picture that follows is that angle.


Below is a second culvert in that same area, conducting sediment:

This is how sedimentation gets into the stream, which can be upstream of any logging buffers next to the stream. Yet, the Forest Service bases its conclusion that there won't be sedimentation because PACFISH/INFISH buffers will stop it.

The following photos also illustrate a few of the problems associated with inadequate road maintenance. On July 7, 2019 an intense thunderstorm dropped rain and hail on portions of the Bitterroot National Forest. These photos are of an open Forest Service Road just south of Lake Como, probably FSR #550. All three were taken a few feet from one another. The first photo shows a stream of stormwater flowing down the road, where water flows off the surface into a draw in the landscape. The length of this stream of water on the road surface was over a quarter-mile—even around curves—essentially cutting a gully instead of flowing off the road within a short distance.

The second photo (above) shows this “stream” at the beginning of its flow off of the road at the location of the discharge of a small culvert (the culvert is not visible in the photo).

The third photo (below) shows the inlet of the culvert—empty of water despite the storm because of the tempering effect of the native forest vegetation in the draw above the road. (It also shows the culvert has begun to plug up since the time of installation or previous maintenance, meaning it is becoming vulnerable to a blowout during a subsequent storm event.)

These three photos are not meant to illustrate water quality problems because the flow was not followed downslope to any water body destination, which it may or may not have reached before soaking into the soil. Instead, the photos show typical problems of roads without proper drainage features and/or lacking frequent enough maintenance, leading to accelerated erosion during storm or spring runoff events and necessitating more imminent maintenance steps needed to keep the road usable by the public.

Forest Plan standards include, “Secure favorable condition of flow by maintaining the integrity and equilibrium of all stream systems.” The EA fails to demonstrate that integrity and equilibrium of all stream systems is being maintained.

Forest Plan standards also include, “Manage water quality and stream conditions to assure management activities do not cause permanent or long-term damage to beneficial uses.” Since the EA fails to demonstrate that integrity and equilibrium of all stream systems is being maintained, it fails this standard also.

Forest Plan standards also include:

> Design, schedule and implement management activities that would: 1) maintain water quality and stream conditions that are not likely to cause sustained damage to the biological potential of the fish habitat, 2) not reduce fish habitat productivity in the short-term below the assigned standard, 3) maintain water quality in a condition that is not likely to inhibit recovery of the fish habitat…

Cumulative Effects

The Water Resources Report states, "The Water Erosion Prediction Project (WEPP) runoff and erosion prediction model (Flanagan and Livingston 1995) was used to estimate average annual soil erosion and sediment delivery for proposed harvest and activity fuels, prescribed fire, and road actions."

The FS uses an improper scale for watershed analysis, both for ECA and sediment yield. HUC12 analysis areas water down potential significant impacts. The Clearwater Forest Plan Appendix K has divided streams down to smaller areas than a HUC 12 area, so for streams that are impaired and stand to be more so because of this project. Using the larger HUC 12 analysis will mask potentially significant effects at the smaller subwatershed scale, such as the Bakes Fork. Dr. Harry Jageman's objections discusses specific examples. The analysis should be done at the stream level identified in the Clearwater Forest Plan. You have not done that, which doesn't take a hard look with analysis.

The Fisheries Specialist Report states:

> The cumulative effects area for aquatic resources is the entirety of the two subwatersheds that are part of the project area. This is because habitat conditions for aquatic organisms downstream of the project area or along haul routes can conceivably interact with existing and foreseeable conditions in the non-project portions of these subwatersheds…

The Water Resources Report states:

> In addition to the White Pine project, the planned Crane Point project includes timber harvest and prescribed fire that would occur in portions of the Headwaters hangman Creek and Meadow Creek HUC 12 subwatersheds.

The EA claims to analyze cumulative effects of increased runoff/peak flows due to both those projects: "Cumulative ECAs are 16 and 14% within the Headwaters Hangman Creek and Meadow Creek HUC 12 subwatersheds, respectively (considering the existing condition and proposed actions of the White Pine and Crane Point projects)." However, the EA fails to estimate or analyze cumulative sediment delivery.

And although the "currently-in-analysis Gold Hill project" (for which the FS has already issued a draft DN) and the "planned Strychnine Pine project" are mentioned as foreseeable actions in some of the cumulative effects watersheds, there is no analysis of their cumulative effects.

The Fisheries Specialist Report mentions other actions in the cumulative effects analysis area:

> In addition to the White Pine project, the planned Crane Point projects includes timber harvest (and associated road work) and prescribed fire that would occur in portions of the Headwaters Hangman Creek and Meadow Creek HUC 12 subwatersheds (Figures 3a and 3b). The planned Strychnine Pine project and the

> currently-in-analysis Gold Hill project (Figures 3a and 3b) would also be implemented in the same Palouse River drainage HUC10 watershed as White Pine and Crane Point, including a portion of the Meadow Creek subwatershed for Gold Hill. Traeumer and Hovde (2019) determined that the combined direct and indirect effects of the White Pine and Crane Point projects on water yield and sediment deliver would be negligible, and therefore would not contribute to cumulative water yield or water quality effects. The Gold Hill and Strychnine Pine projects would be implemented with similar Project Design Features and BMPs, so the same conclusion can be drawn regarding cumulative effects on hydrologic processes.

We note it says, "the combined direct and indirect effects of the White Pine and Crane Point projects on water yield and sediment deliver would be negligible, and therefore would not contribute to cumulative water yield or water quality effects." Yet nowhere does the FS actually provide any <u>quantitative</u> data on cumulative water yield or water quality effects, so there's no basis for the conclusion. Arbitrary and capricious.

Also, "The Gold Hill and Strychnine Pine projects would be implemented with similar Project Design Features and BMPs, so the same conclusion can be drawn regarding cumulative effects on hydrologic processes." Such unsupported statements do not suffice for taking the "hard look" NEPA requires.

"Of the other named (and fishbearing) streams at least partially within the project area, the mainstem of Mannering Creek is closely paralleled by Idaho Route 6 and so is (barely, but almost entirely) excluded from the project area; nearly half of its drainage originates in the project area, however." However, cumulative effects on this stream are not adequately analyzed.

The Water Resources Report does not explain why estimated sediment yields over natural conditions due to project activities are "immeasurable" at the same time the numbers are not zero. The EA fails to explain or define what "measurable" sediment increases would be. It says, "0.50 tons per acre …is considered immeasurable and negligible" but doesn't explain why. This is arbitrary and capricious, especially since streams like Blakes Fork is limited by sediment and is a sensitive stream.

The Forest Service hasn't accounted for the cobble embeddedness changes that have occurred in Blakes Fork Creek and other drainages after the White Pine Timber Sale (1997 ROD). The 1997 White Pine FEIS noted that Blakes Fork was a "very sensitive stream." This often relates to RMOs bank stability, width to depth ratio, instream large woody debris, and pool frequency. In Appendix B of the fisheries report, in 1998, cobble embeddedness for Blakes Fork was 51 percent. The 1997 White Pine EIS predicted benefits to Blakes Fork. But, in 2018, cobble embeddedness on Blakes Fork had increased to 85 percent. The 1997 White Pine Project logged in Blakes Fork between then and now. How has the first White Pine Project contributed to the current conditions?

USDA Forest Service 1994b states:

> It is important to recognize that the Equivalent Clearcut Area model uses tree growth (canopy density) to estimate Spring peak flows and that channels do not recover immediately in response to tree growth. There is a lag time between hilltop recovery (growth) and channel recovery. The length of the lag time is difficult to predict and is likely to be influenced by factors other than simply canopy density (e.g. the role of culvert failures, in-stream activities, geology, etc.).

Peak flows can be altered by forest harvest activities after removal of canopy through less interception, which results in more snow accumulation and snowmelt available for runoff (Troendle and King 1985). The EA does not disclose the potential for the project to damage channel morphology and aquatic habitat, with its overly simplistic ECA methodology.

The analysis of the effects of roads fail to take into account the increases of extreme peak flows due to the high density of roads. Forest Service hydrologist Steve Johnson, states, "Impacts from roads basically fall into three areas: introduced sediment into streams; snowmelt re-direction and concentration; and surface flow production." (Johnson, 1995.)

Johnson (1995) discusses how "snowmelt re-direction and concentration and surface flow production" increase peak flow amounts <u>multiplicatively</u> by the presence of roads in a drainage.

We noted in earlier comments that we expected the Forest Service to review the monitoring requirements for the White Pine project in any analysis, and this was not done. Mitigation requirements prior to the first White Pine Sale included monitoring stream temperature three years before and three years after the sale to monitor where improvements are taking place in that area. The agency also indicated there were 18 transects permanently located on Meadow Creek for fisheries condition, and they would be resurveyed. (White Pine I, Ch. II, p. 15). These were planned to monitor pre- and post-sale conditions. Where are those results? This is part of assessing the impacts from past activities in a cumulative effects analysis, especially since the standards have not been met for over 30 years.

The Existing Conditions for Maximum Sediment Yield Percent Over Natural are described only in citing a "Clearwater National Forest Watershed Condition Report (Jones and Murphy 1997)." However, citing a report over 20 years old is not taking a hard look as NEPA requires.

In the first White Pine project, it discussed the East Dennis Salvage Sale in Meadow Creek drainage under cumulative effects. The first White Pine (EIS) analysis also acknowledged that logging was ongoing in the Meadow Creek drainage on Potlatch Corporation land and will continue into the future (White Pine I EIS around pdf p. 59). Is that logging still ongoing? If so, when did it stop and what are the downstream impacts that this project would add to?

"The haul route for one harvest unit in the proposed action, however, would apparently cross one or a few small headwater tributaries of the South Fork of Santa Creek or Willow Creek (these streams are both in the Upper Santa Creek HUC 12)." (Fisheries Specialist Report.) As discussed elsewhere, there's no analysis—direct, indirect, or cumulative—which considers impacts of log hauling, so conditions for native aquatic species in those streams are also ignored.

The Fisheries Specialist Report states, "The historic presence of cutthroat trout (of the Yellowstone or Westslope subspecies) in the Palouse or Hangman drainages is not known with any certainty (see below), but historic recent sampling in the vicinity of the project area did not fully document the presence of either form." USDA Forest Service, 2017c explains that native westslope cutthroat trout have declined due to habitat degradation and competition with nonnative brook trout (the latter being the most prevalent trout species in the project area):

> The distribution and abundance of westslope cutthroat trout has declined from historic levels (less than 59 percent of historically occupied stream habitat) across its range, which included western Montana, central and northern Idaho, a small portion of Wyoming, and portions of three Canadian provinces (Liknes and Graham 1988, Shepard et al. 2005). Westslope cutthroat trout persist in only 27 percent of their historic range in Montana. Due to hybridization, genetically pure populations are present in only 2.5 percent of that range (Rieman and Apperson 1989). Introduced species have hybridized or displaced westslope cutthroat trout populations across their range. Hybridization causes loss of genetic purity of the population through introgression. Within the planning area, genetically pure populations of westslope cutthroat trout are known to persist in Ruby Creek (MFISH 1992, 2012). Some of these remaining genetically pure populations of westslope cutthroat trout are found above fish passage barriers that protect them from hybridization, but isolate them from other populations.
>
> Brook trout are believed to have displaced many westslope cutthroat trout populations (Behnke 1992). Where the two species co-exist, westslope cutthroat trout typically predominate in higher gradient reaches and brook trout generally prevail in lower gradient reaches (Griffith 1988). This isolates westslope cutthroat trout populations, further increasing the risk of local extinction from genetic and stochastic factors (McIntyre and Rieman 1995).
>
> Habitat fragmentation and the subsequent isolation of conspecific populations is a concern for westslope cutthroat trout due to the increased risk of local and general extinctions. The probability that one population in any locality will persist depends, in part on, habitat quality and proximity to other connected populations (Rieman and McIntyre 1993). Therefore, the several small, isolated populations left in the project area are at a moderate risk of local extirpation in the event of an intense drainage-wide disturbance.
>
> Habitat degradation also threatens the persistence of westslope cutthroat trout throughout their range. Sediment delivered to stream channels from roads is one of the primary causes of habitat degradation. Sediment can decrease quality and quantity of suitable spawning substrate and reduce overwintering habitat for juveniles which reduces spawning success and increases overwinter mortality. Roads can also alter the drainage network of a watershed and thereby increase peak flows. The end result of increased peak flows is decreased channel stability and accelerated rates of mass erosion. Across their range the strongest populations

> of westslope cutthroat trout exist most frequently in the wilderness, Glacier National Park, and areas of low road densities or roadless areas (Liknes and Graham 1988, Marnell 1988, Rieman and Apperson 1989, Lee et al. 1997).

<u>PACFISH direction</u>

The PACFISH Forest Plan Amendment was adopted in 1995. It includes direction such as Standards and Guidelines as well as Riparian Management Objectives (RMOs). Yet the Fisheries Specialist Report and EA fail to provide an analysis regarding PACFISH direction. Given the problems with Blakes Fork and Meadow Creek at least as far back as 1997, as detailed in the 1997 White Pine Timber Sale FEIS, without an analysis of trends or measures for RMOs for bank stability, width to depth ratio, instream large woody debris, and pool frequency we can only surmise that RMOs are not being met any better now than in 1997. But there's no analysis that discusses current conditions in relation to RMOs. Apparently it's the FS's position that never achieving RMOs is okay.

The EA fails to present a sufficient analysis to determine if RMOs would be retarded by project and cumulative impacts. The EA fails to conduct a proper analysis of water flow alteration effects on stream bank erosion and channel scouring during spring runoff and/or rain-on-snow (ROS) events. Most segment altering and channel forming events occur during instantaneous flows.

Openings accumulate much more snow than in a forested areas that are not as "open," thus provide a significant contribution to water yield especially during ROS and spring runoff events. The number, mileage and proximity of the roads to the proposed logging units and streams are important because they will also have a significant effect on peak flows and the resultant impact on fish, steam channels and possible flooding.

Kappesser, 2002 discusses an assessment procedure used on the IPNF:

> The RSI [Riffle Stability Index] addresses situations in which increases in gravel bedload from headwaters activities is depositing material on riffles and filling pools, and it reflects qualitative differences between reference and managed watersheds…it can be used as an indicator of stream reach and watershed condition and also of aquatic habitat quality.

According to Kappesser, 1992:

> The stability condition of a watershed may be broadly determined by evaluating the level of harvest activity (ECA), its spatial distribution with regard to headwater harvest and rain on snow risk and the density of roading in the watershed with consideration of road location relative to geology and slope. Each of these four factors may [be] evaluated against "threshold" levels of activity characteristic of watersheds on the IPNF that are known to be stable, unstable, or on a threshold of stability.

ROS events can be the most channel changing, sediment producing events and can have a significant adverse effect on fish and their habitat (Kappesser, 1991b):

> Filling of pools by bedload sediment is seen as a significant factor in the reduction of rearing and overwintering habitat for fish such as West Slope Cutthroat Trout (Rieman and Apperson, 1989). Bedload increases have traditionally been interpreted as the result of channel scour in response to increased peak flows created by timber harvest.

(Also see Kappesser, 1991a.) The Inland Northwest frequently gets at least one mid-winter chinook which is often accompanied by windy and rainy conditions. The warm wind blowing across the snow, especially in relatively open areas on south and southwestern facing slopes between 2,500 to 4,500 feet elevation results in rapid snow melt and high levels of instantaneous water flows.

The Fisheries Resource Report states:

> Based on the Hydrology specialist report for this project (Traeumer and Hovde 2019), harvest and road-related activities under the proposed action would slightly to moderately increase water yields over the baseline, but the increases would not result in adverse effects on stream channels and so should not alter stream habitat quality to a measurable or biologically significant degree.

Similar to its failure to downplay sediment impacts by avoiding genuine analysis, the FS minimizes the fact some of these stream channels already show signs of significant management-induced damage so further increasing peak flow is, by definition, significant.

It also makes no sense for the FS to say that the massive clearcutting will have no effect on water temperature. Even though relatively little vegetation disturbance would be carried out within default riparian buffers, those upland clearcuts correlate with increasing water temperatures in streams. Guenther et al. (2014) found increases in stream temperature in relation to selective logging. They found increases in bed temperatures and in stream daily maximum temperatures in relation to 50% removal of basal area in both upland and riparian areas. Increases in daily maximum temperatures varied within the logged area from 1.6 to 3 degrees Celsius.

US Fish and Wildlife Service (1998) recognizes, upland forest canopy removal raises stream temperatures. The FS must address best available science which indicates the openings created by the project clearcuts would result in increases to water in streams. (*Id.*):

> Groundwater entering streams (especially small streams) may be an important determinant of stream temperatures (Spence et al. 1996) or may provide localized thermal refugia in larger stream systems. Where groundwater flows originate above the neutral zone (16-18 meters below the surface in general) groundwater temperatures will vary seasonally, as influenced by air temperature patterns (Spence et al. 1996). Timber harvest from upland areas exposes the soil surface to greater amounts of solar radiation than under forested conditions (Carlson and

> Groot 1997), elevating daytime temperatures of both air and soil (Fleming et al. 1998, Buckley et al. 1998, Morecroft et al. 1998) and increasing diurnal temperature fluctuations (Carlson and Groot 1997). Relationships between shallow source groundwater flows and air and soil temperatures indicate that harvest activities in upland areas may increase stream temperatures via increasing temperature of shallow groundwater inflows. Other pathways for harvest actions to influence stream temperature include changing the volume and timing of peak flows, elevating suspended sediment levels, and altering channel characteristics (Chamberlin et al. 1991, Spence et al. 1996, USDA and USDI 1998a).

US Fish and Wildlife Service, 1998 also states:

> Bull trout spawning typically occurs in areas influenced by groundwater (Allan 1980; Shepard et al. 1984; Ratliff 1992; Fraley and Shepard 1989). In a recent investigation in the Swan River drainage, bull trout spawning site selection occurred primarily in stream reaches directly influenced by groundwater upwellings or directly downstream of these upwelling reaches (Baxter and Hauer, *in prep.*). In addition, warmer summer stream temperatures, as well as extreme winter cold temperatures that can result in anchor ice, may be moderated by cold water upwellings.
>
> Surface/groundwater interaction zones, which are typically selected by bull trout for redd construction, are increasingly recognized as having high dissolved oxygen; constant cold water temperatures, and increased macro-invertebrate production (R. Edwards, University of Washington, pers. Comm. 1998).

"The streams within the project portion of the Hangman Creek subwatershed, based on field observations and limited other data, do not appear to be large enough to be fishbearing year-around, but are headwaters to portions of streams which support Conservation Populations of Sensitive redband trout." If the FS doesn't want to bother surveying for fish presence, the analysis is obligated to treat these streams as fishbearing.

"Live western pearlshell mussels were observed by Forest Service staff during a fish habitat survey in a Meadow Creek section within Unit F21 in the summer of 2018, but it is not known if individuals of the species are present in other perennial streams of the project area, but it seems likely that individuals are present in other low-gradient section of Meadow Creek (and perhaps other project tributaries)." *(Id.)* The western pearlshell life cycle includes the infants attaching themselves to the gills or fins of a passing host fish.
https://www.fws.gov/refuge/willapa/wildlife_and_habitat/western_pearlshell_mussel.html

Population Trends

The EA and Fisheries Specialist Report also don't contain an analysis of fish population trends. The Forest Plan requires such monitoring, but this is part of the failure of the FS to monitor as the plan requires. This goes for MIS, Sensitive, and ESA-listed species. The FS simply does not know population trends of native fish species.

There is insufficient analysis of the health of the populations of native aquatic species in project area streams. There's no discussion on how past management actions have affected fish. There isn't a proper cumulative effects analysis. NEPA and NFMA are violated.

Remedy: Prepare an EIS that addresses the issues we discuss above; or better yet choose the no action alternative.

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