January 10, 2020

Sent via email to appeals-northern-regional-office@usda.gov and via US Mail

To: Objection Review Officer, USDA Forest Service, Northern Region, 26 Fort Missoula Road, Missoula, MT 59804

RE: OBJECTION to HUNGRY RIDGE EIS and draft ROD

Responsible Official: Cheryl Probert, Forest Supervisor, Nez Perce-Clearwater National Forests

Pursuant to 36 C.F.R. Part 218, Friends of the Clearwater (FOC) and Alliance for the Wild Rockies (AWR) file this objection to the environmental assessment (EA) and draft decision notice with a finding of no significant impact (DN-FONSI) issued by Forest Supervisor Cheryl Probert for the Hungry Ridge project. This timber sale is proposed for the Salmon River Ranger District of the Nez Perce National Forest (a portion of the administratively combined Nez Perce-Clearwater National Forests).

Pursuant to Part 218, FOC is the lead objector whose contact person is Gary Macfarlane, FOC Ecosystem Defense Director, P.O. Box 9241, Moscow, ID 83843 (Tel: 209-882-9755). Attachments, references, and other incorporated documents are included on the data CD with the version sent to the Forest Service (FS) via US mail postmarked this date.

The draft decision notice selected Alternative 2, which proposes logging approximately 7,164 acres, as described in the EIS:

* Conduct commercial timber harvest on approximately 7,164 acres using intermediate (1,959 acres) and regeneration (5,205 acres) prescriptions.
* Conduct prescribed burning on approximately 9,161 acres to treat natural fuels and activity residual fuels from harvest operations.
* Construct less than 9 miles of permanent road (specified) for long term use.
* Construct approximately 23 miles of temporary road to facilitate timber harvest, and decommission following use.
* Recondition approximately 34 miles of road that require more work than road maintenance to bring up to a safe standard for log haul and vehicular passage.

FOC and AWR filed timely comments and input during the scoping period (on March 31, 2014), and the DEIS comment period (on April 23, 2018). Bill Kowaleski attended public meetings and provided input as well.

We also incorporate the objection of Harry Jageman into our objection. It is attached.

Sincerely submitted,

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CLIMATE CHANGE AND CARBON SEQUESTRATION

We addressed issues with climate change and carbon sequestration on pages 50-52 of our DEIS comments and noted in scoping that the Forest Service demonstrates it has been successful in creating more resilient and diverse forest structures on this forest with large logging projects like this one. We incorporate our DEIS here by reference, as there were issues that went unaddressed by the Forest Service in its FEIS.

Global warming drives wildfire (Pechony and Shindell 2010; Pierre-Louis and Popovich 2018). But, logging contributes to carbon emissions and does not reduce total emissions from wildfire. (Campbell et al. 2012 found that the amount of carbon removed with treatments was three times more than what it saved by altering fire behavior.)[1] So, logging and contributing to carbon emissions will neither make forests more resilient nor mitigate our contribution to a warming world—logging conversely contributes to climate change. Yet, the Forest Service presents this project as if the opposite is true. The EIS entirely misses this discussion.

To all of our points on climate change in the DEIS, the Forest Service either ignored them or responded that **a forest-level analysis of carbon sequestration and greenhouse gas emissions is outside the scope of the project,** that Hungry Ridge project **emissions are not a major source of greenhouse gases, that forested land would not be permanently lost and would grow back, returning to a carbon sink as quickly as possible, and that "reducing stand density, one of the goals of this proposed action, is consistent with adaptation** practices to increase resilience of forests to climate-related environmental changes (Joyce et al. 2014)." *See* Appendix F.

The FEIS is still missing a significant discussion on climate change and carbon sequestration, which is an ever-increasingly urgent issue. Indeed, recent research (Buotte et al. 2019) shows the importance of the Nez Perce and Clearwater National Forests. The EIS 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, even as the Forest Service itself has acknowledged that, in many places, climate change has altered ecosystem functions that it would no longer be possible to maintain a historic range of variability. USDA Forest Service 2017b. There is no analysis on the veracity of the project's purpose and need. The Forest Service has not addressed any of this, and has violated NEPA by failing to consider or failing to respond to this.

Among the insufficient discussion, the Forest Service is missing a baseline and discussion on whether the project will contribute to carbon emissions, which science suggests it likely will. Even science suggested by the Forest Service in the FEIS discusses baselines and assessing whether individual projects will be carbon positive:

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[1] See also McKinley et al. 2011: "[I]f the starting point is a mature forest with large carbon stocks [], then harvesting this forest and converting it to a young forest will reduce carbon stocks and result in a net increase in atmospheric [CO2] for some time.

> [I]f the starting point is a mature forest with large carbon stocks (Cooper 1983, Harmon et al. 1990), then harvesting this forest and converting it to a young forest will reduce carbon stocks and result in a net increase in atmospheric [CO2] for some time (Fig. 8B; Harmon and Marks 2002). Even if the mature forest is converted to a very productive young forest, it could take several harvest intervals to equal the amount of carbon that was stored in the mature forest, even with 100% utilization efficiency, biomass for energy and substitution (Harmon et al. 1990; Fig. 8A).

McKinley et al. 2011. This project, and its proposal to log in old growth, would convert mature parts to a young forest in ways not considered with an environmental baseline or a project-level analysis. This failure to disclose, consider, and analyze violates the requirements of NEPA.

The Forest Service has failed to analyze at the project-level and forest-level carbon sequestration and greenhouse gas emissions, and the impacts of this project and cumulative impacts are affecting the Nez Perce National Forest's capacity as a carbon sink.

The FS's position on project impacts on climate change is that the project would have a miniscule impact on global carbon emissions or is outside the scope of this project. 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 in this EIS. The EPA has rejected this sort of analysis because cumulative effects would always dilute project effects. *See* Lower Yaak, O'Brien, Sheep FEIS pp. 818-19. The FS should consider both local and regional scopes and the significant impacts of its carbon footprint on each, and this should be analyzed and disclosed in a NEPA document. The Forest Service has increased timber harvest in this forest to its highest annual amounts since 2010 in the past four out of five years.[2]

Without a discussion and analysis of the project and forest-wide trends based on the carbon emissions of logging, there is nothing to support a cumulative analysis as to a project-level and forest-wide impacts on the Nez Perce-Clearwater National Forests' capacity as a carbon sink. Asserting that there are some trees left, in the agency's words, the Nez Perce and Clearwater National Forests "are anticipated to continue functioning" as a carbon sink is not the level of analysis that NEPA demands. This is overly general and does not discuss or consider how this project and the cumulative effects from all the projects in this forest over the past few years have impacted the two forests' capacity as a carbon sink mitigating global warming. The Forest Service has not adequately addressed the environmental impacts of this project or responded to our comments as required by NEPA. Even the science the Forest Service has cited discusses assessing a baseline for the project area's carbon storage and discussing whether the project will be carbon positive. McKinley et al. 2011. That is project-level analysis utterly ignored in the EIS. This is a violation of considering the cumulative and significant impacts of this project through proper analysis under NEPA, and of disclosing such high-quality information to the public.

Forest Service's claim that forested land would not be permanently lost and would grow back, returning to a carbon sink as quickly as possible, and the Forest Service's assertion

[2] We graphed the activity of the timber sold in the Nez Perce-Clearwater National Forests. That graph appears in the old-growth section of these comments.

that reducing stand density is consistent with adaptation and making forests more resilient in the face of climate change.

The Forest Service is assuming that reforestation will occur as it always has. This may not be true if local genotypes for which the Forest Servicing is aiming has an adaptational temperature lag, which prevents successful reforestation absent much more care in the seeds selected to plant. Browne et al. 2019. The EIS 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.

The EIS ignores scientific opinion on forest management's negative effects on carbon sequestration. The best available science supports the proposition that forest policies must shift away from logging if a priority is carbon sequestration. Forests should be preserved indefinitely for their carbon storage value.

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.

Courtesy Kim Davis

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."
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> 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.
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> "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."
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> 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.
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> "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."
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> 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.
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> 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.
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> 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.

That scientific article is Davis et al., *Wildfires and climate change push low-elevation forests across a critical climate threshold for tree regeneration*, in the Proceedings for the National Academy of Sciences, 116(13): 6193-6198. These researchers found, "Annual rates of tree regeneration exhibited strongly nonlinear relationships with annual climate conditions, with distinct threshold responses to summer VPD, soil moisture, and maximum surface temperatures

[]. Across the study region, seasonal to annual climate conditions from the early 1990s through 2015 have crossed these climate thresholds at the majority of sites [], indicating conditions that are increasingly unsuitable for tree regeneration, particularly for ponderosa pine." The study region includes the Northern Rockies, and spans areas within the Clearwater Basin and close to and within the Nez Perce-Clearwater National Forests.

In a literature review, Simons (2008) states, "Restoration efforts aimed at the maintenance of historic ecosystem structures of the pre-settlement era would most likely reduce the resilient characteristics of ecosystems facing climate change (Millar 1999)." The project area and NPCNF have been fundamentally changed, so the agency must consider how much native forest it has fundamentally altered compared to historic conditions forestwide before pursuing "treatments" here. And that includes considering the effects of human-induced climate change. Essentially, this means considering new scientific information on all kinds of changes away from historic conditions.

The FS (in USDA Forest Service, 2017b) discusses some effects of climate change on forests, including "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." The EIS has no scientific basis for its claims that proposed vegetation "treatments" will result in sustainable vegetation conditions under likely climate change scenarios.

Hayward, 1994 essentially calls into question the entire manipulate and control regime, as represented in project design. The managed portion of the NPCNF has been fundamentally changed, as has the climate, so the FS must analyze how much land has been fundamentally changed forest wide compared to historic conditions, and disclose such information to the public in an EIS.

The Kootenai NF's March 2017 Galton Final Environmental Impact Statement acknowledges that management and a warming climate has influenced ecosystems:

> This analysis identifies specific disturbance processes, together with landform and other environmental elements, which have influenced the patterns of vegetation across the Decision Area. Vegetative Response Units (VRUs) were used to define and describe the components of ecosystems. VRUs are used to describe an aggregation of land having similar capabilities and potentials for management. These ecological units have similar properties in natural communities: soils, hydrologic function, landform and topography, lithology, climate, air quality, and natural processes (nutrient and biomass cycling, succession, productivity, and fire regimes).
>
> Each VRU has a characteristic frequency and type of disturbance based on its climate, soils, vegetation, animals, and other factors. Populations of native plants and animals have responded and adapted to these characteristic disturbance regimes over time (~2500 years) and the resulting vegetation patterns, processes, and structure within a historical range of variability. These characteristic processes, patterns, and structure are termed "Reference Conditions".

The EIS fails to analyze and disclose how climate change already influences forest ecology and expected to do so in the future. Even Joyce et al. 2014 states that "trees die faster when drought is accompanied by higher temperatures," so if global warming leads to more drought, science supported by the Forest Service in this project undermines the agency's assumption that cutting trees and reforestation can get return the project area to any "historical" condition. All science we've cited, and even science the Forest Service has cited, strongly suggests that reforestation will change in this changing climate, and this Forest Service hasn't attempted to address that issue, which can have vast ramifications as to whether the forest in the project area will respond as the FS assumes it will.

Additionally, climate-related environmental change will speed up with carbon emissions, and logging increases carbon emissions more than wildfires. Law et al. 2018 states that reducing carbon emissions must happen quickly to counter rising temperatures: "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."

One of the key messages from the Joyce et al. 2014 article the Forest Service cited is that U.S. forests "currently absorb and store the equivalent of about 16% of all carbon dioxide (CO2) emitted by fossil fuel burning in the U.S. each year" but that "Climate change, combined with ***current societal trends in land use and forest management***, is projected to ***reduce*** this rate of forest CO2 uptake." (emphasis added)

The EIS 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 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. Clearly, the FS is not considering best available science on this topic.

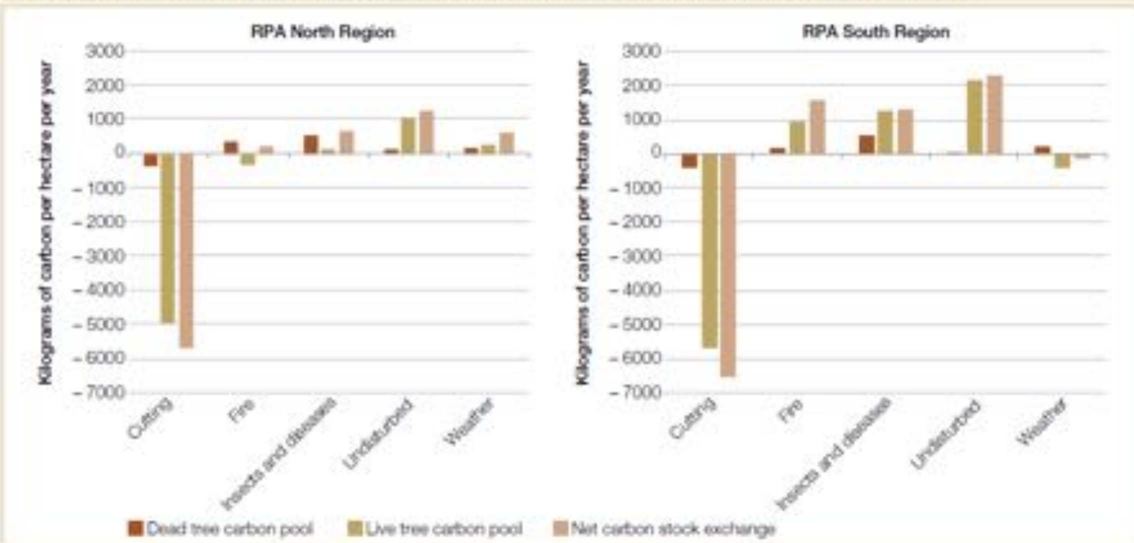
The FEIS's added discussion on carbon storage and natural disturbances v. harvest had a vague statement and was misleading, violating NEPA's requirement to disclose high quality information. The Forest Service stated,

> In the Northern Region, total forest carbon (forest ecosystem and harvested wood products) sequestration is estimated at 5.83 Tg carbon per year for the baseline period of 1990 to 2013 (USDA, Forest Service 2015d). This represents roughly 3% of the total carbon sequestered by U.S. forests. Fire, insect, and disease disturbance have the greatest effect on carbon storage on national forest lands of the Northern Region, yet these typically affect < 1% of the total forested area each year (USDA, Forest Service 2016f). **Harvest affects an even smaller percentage of National Forest land, and does not have a long-term effect on carbon**

sequestration or storage because the land is not converted from forest to a different land use (Conant et al. 2007, Ryan et al. 2010, McKinley et al. 2011).

FEIS, Chap 3, p. 73 (emphasis added). The Forest Service cited USDA, Forest Service 2016f (Future of America's Forests and Rangelands, Update to the Forest Service 2010 Resources Planning Act Assessment. Forest Service Research and Development Gen. Tech. Rep. WO-94 September 2016. 250 p.) to support this. The statement from the FEIS is a bit misleading when examining the chart from that same document that depicts carbon accumulation (storage) rates based on disturbance:

Figure 8-4. Carbon accumulation rates (kilogram per hectare per year) resulting from disturbances in the Eastern United States, based on the most recent remeasured Forest Inventory and Analysis data (about a 6-year time step).



USDA Forest Service 2016f, Chapter 8, p. 5. "Note that in all cases, except weather disturbances in the South Region, the net carbon accumulation is positive. Also note that the influence of these disturbances is substantially different from forest cutting, in which decreased carbon accumulation is seen in the live tree pool, the dead tree pool, and net carbon accumulation." USDA Forest Service 2016f, Chapter 8, p. 4. Logging eliminates carbon sequestration, and the Forest Service needs to account for the project's reduction of carbon sequestration capacity in the project area and how that contributes to cumulative effects forest wide.

For the above reasons, the Forest Service has violated NEPA, among which includes its duty to disclose high-quality information, its duty to meaningfully respond to the public's comments, its duty to honestly analyze the adverse impacts of the project, its duty to engage in any analysis on the project and regional level, its duty not to misrepresent the science it relies upon, and its duty to take a hard look at the consequences of its actions.

Remedies:
1) Choose the no-action alternative;
2) Withdraw the project;
3) Do a climate change/carbon sequestration analysis that addresses the issues raised above.

OLD GROWTH

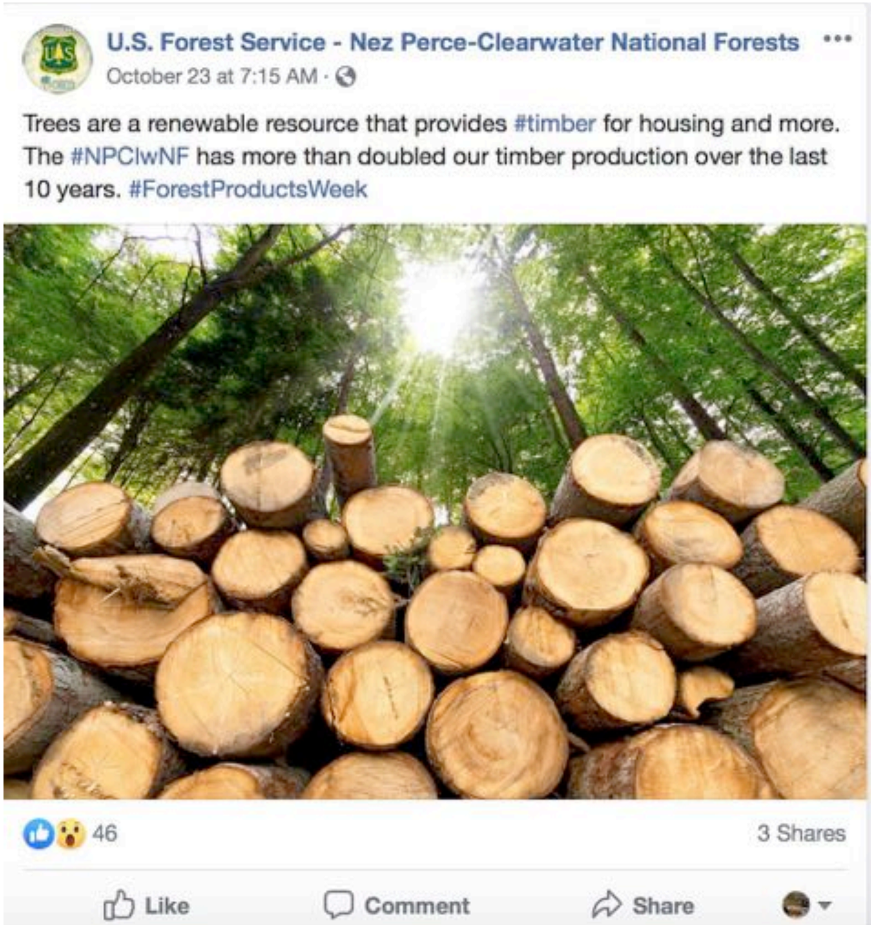
We raised the issues on page 30-33 of our DEIS comments. We note that the agency has proposed a forest plan amendment to log in an MA-20 area, which is an area set aside for old-growth management, but is not necessarily synonymous with old growth. We agree with this forest plan interpretation that logging to go forth in MA-20 area needs a forest plan amendment, as this is how the agency originally interpreted its duties regarding these designated areas. The entire point behind old-growth is to provide habitat for the species that rely on these types of landscapes. Old growth direction and analysis is not based on the best available science. The Forest Service cites Green et al. but doesn't follow those recommendations.

1)The Forest Service is using stale support or unreliable support for the assertion that it is meeting old growth percentage forest-wide, and has not considered the cumulative effects in tandem with the stale numbers. Cumulative effects have been insufficiently discussed.

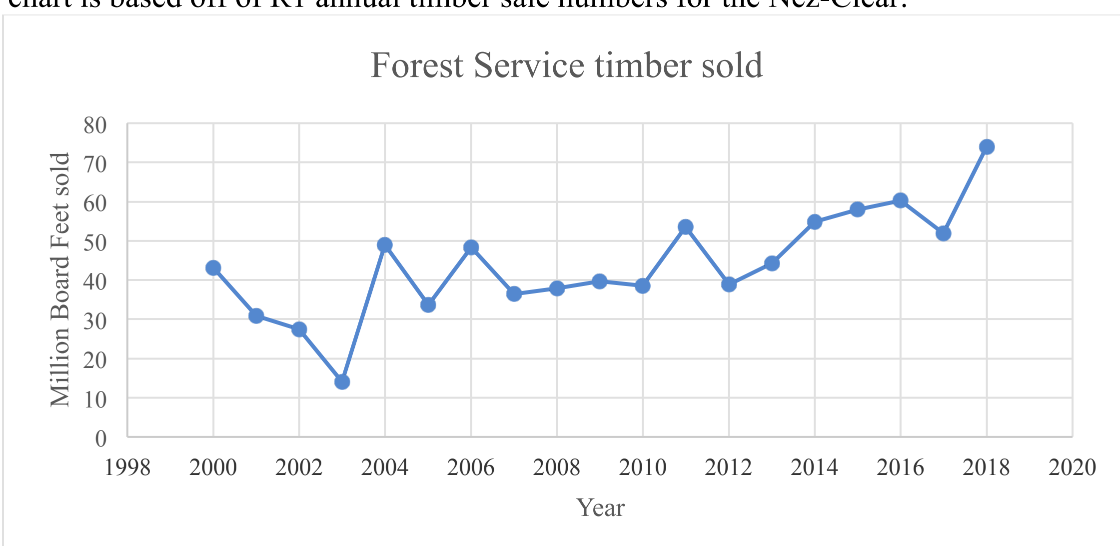
In our comments (*see* page 31-33), we raised concern with the old-growth analysis, including the amount the Forest Service disclosed. We noted in our comments on the DEIS included our concern that the analysis of the old growth in the project area was vague and misleading, that MA20 maps did little good because the Forest Service noted "Field reconnaissance has demonstrated inconsistencies with MA20 allocations and what is actually present within the stands."[3] We also asked how much of the old growth categories overlapped with MA20s. We don't think the FEIS is accurate.

The agency has undoubtedly increased timber sales. On October 23, 2019, on Facebook, it posted the following:

[3] In response to this comment, the Forest Service simply omitted its original statement between the draft and final EISs.



This chart is based off of R1 annual timber sale numbers for the Nez-Clear: [4]



[4] *See also* R1 Timber sold annual report folder, which contains the chart and the support for the numbers used in the chart.

Despite doubling timber production since 2010, the Forest Service is using Bush et al. 2010 Forest Inventory and Analysis for a starting point on old growth. Since 2010 and that analysis, however, some of this increased timber production has come from old growth forests on the Nez Perce National Forest, and the Forest Service has also found the 2010 figures to contain areas that don't meet forest-plan old growth standards. This renders the 2010 starting point stale data, as supported by the following projects that post-date Bush et al.:

Center Johnson: Approved logging in forest plan OG (final EA p. 46).
Dutch Oven Vegetation Management Project: Also used the Bush et al. 2010 analysis to identify old growth, but upon field visits to only some of what Bush et al. 2010 identified, the Forest Service found on-the-ground that the area did not in fact have old-growth characteristics, and even that one unit had been harvested. (Final EA May 2017 pdf p.168).
Windy Shingle: Used the Bush et al. 2010 analysis as a starting point and approved logging in areas the Forest Service identified as old growth. (Windy Shingle wildlife report, pdf pp. 7, 119).
Iron Mountain: Cited same 12.9% figure from 2010 (EA pdf p. 76), and likely approved logging in old growth (EA pdf p. 79 and DN-FONSI).
End of the World: Used the Bush et al. 2010 analysis and proposed logging in "mature or overmature trees."[5] (*See* USDA Forest Service 2019, Nez Perce-Clearwater National Forest End of the World Environmental Assessment and draft Finding of No Significant Impact and accompanying Wildlife Report); "754 acres …converted through regeneration harvest" (EA)
Hungry Ridge (this project): Proposed action to log in MA20 with a forest plan amendment, with up to 826 acres of forest-plan old growth (DEIS pdf p. 29).

We don't know if these are all the projects because the Forest Service has not reviewed its impact on old growth in the Nez Perce National Forest since 2010—it keeps using the Bush et al. 2010 number of 12.9% as a starting place,[6] even though field visits in at least one project (Dutch Oven Vegetation Management Project) demonstrated the inaccuracies with even this number. Bush et al. goes off of FIA data, and FIA data does not determine the size of any particular old-growth stand.

These projects represent cumulative effects on old growth that the agency has ignored and failed to consider or discuss under its duties in preparing an EIS under NEPA. As such, this failure does not disclose high quality information to the public and fails to take a hard look at the project. Failing to address this issue is also a failure to demonstrate that the Forest Service is complying with the forest-plan minimums for old growth, in violation of NFMA and a failure to take a hard look at the project's impacts as required by NEPA.

The agency's reliance on MA-20 designations to demonstrate it is meeting the old growth standard is similarly problematic. In the draft EIS, the Forest Service stated, "Field reconnaissance has determined inconsistencies with MA20 allocations and what is actually present within the stands."[7] We quoted this in our DEIS comments, and asked about an

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[5] Logging in "mature or overmature trees" may very well be old growth, as indicated by the wildlife report but not directly disclosed or discussed in the EA in a manner digestible by the public.
[6] *See* the Hungry Ridge EIS, Chapter 3 p. 260, starting using the Bush et al. 2010 old-growth estimation of "approximately 13 percent."
[7] Hungry Ridge draft environmental impact statement, Chap 1, p. 9

assessment of the acres of forest-plan-designated MA-20 meet forest plan criteria, and separately how many of these MA-20 acres actually meet Green et al. old growth criteria. To do that, the agency would have likely had to field survey these MA-20 areas. Instead, the Forest Service deleted that sentence in the final EIS.

Table 3-50, from the FEIS is an example of inaccuracies and misleading information. We reproduce it here:

Table 3-50. Acres of Management Area 20 (MA20), Forest Plan old growth (FPOG), and North Idaho old growth (NIOG) by old growth analysis area (OGAA)

Old Growth Analysis Area (OGAA)	83060102	83060110	83060112	83060115	83060116	83060118
OGAA total size (NFS lands only)	6519	9981	13028	7282	10303	6779
OGAA forested acres	6008	9397	12535	6911	9661	6302
FPOG	127	145	325	338	165	40
NIOG	322	78	116	40	94	331
NIOG/FPOG[1]	53	492	0	220	0	0
MA20	5	905	1310	671	670	259
Acres of FPOG, NIOG, & FPOG/NIOG that overlap with MA20	0	31	198	158	7	107
Existing OG[2]	507	1589	1553	1111	922	523
% existing OG per OGAA	8%	17%	12%	16%	10%	8%
Replacement OG[3,4]	745	315	805	473	1002	1104
Acres of replacement OG that overlap with MA20	5	1	21	246	50	72
Total OG in OGAA	1247	1903	2337	1338	1874	1555
Total % OG per OGAA	21%[4]	20%	19%	19%	19%	25%[4]

[1]Stands that meet both NIOG and FPOG definitions.
[2]Sum of MA20, Forest plan old growth, North Idaho old growth, and stands that meet both NIOG and FPOG definitions, minus overlap with MA20.
[3]Sum of stands between 110-149 years old.
[4]There are additional immature forest habitats that do not have stand exams that could qualify as replacement old growth.

In the FEIS, the Forest Service noted that

> [S]ome stands labeled as MA20 are not labeled as [Forest Plan Old Growth (FPOG)] or [North Idaho Old Growth (NIOG)]. Not all areas have stand exams and, as stated above, the validation process relies on additional information other than stand exams to allocate management areas within each capability area. This fact does not indicate stands labeled as MA20 alone are not old growth. Those

stands simply lack stand exam data and cannot appear in the query performed to locate NIOG and FPOG.

Hungry Ridge FEIS, Chap. 3, p. 260. If there is a lack of data for some MA-20 areas, there can be no conclusion that the area has forest-plan old-growth characteristics, especially when the Forest Service has acknowledged that some MA-20 designations do not reflect areas that meet the forest-plan old growth criteria. Table 3-50 from the FEIS (reproduced above) illustrates this.

For example, take OGAA[8] 03050110 from the above chart. The chart states that the MA20 area is 905 acres. The chart then states that 31 acres that meet forest plan old growth definitions or North Idaho old growth definitions. If 31 acres of 905 acres matches either or both old growth definitions, this conversely means that 874 acres of the MA20 either do not meet forest plan old growth definitions or the agency has no data on the area—the public cannot tell which. If 874 acres of MA20 do not match forest plan old growth or lack information, the agency cannot use those acres to demonstrate the agency is meeting old-growth requirements outlined in the forest plan. Yet this is exactly what the above table does—it calculates the unknown or the non-old growth acreage into the final old-growth numbers.

We recalculated the numbers in the table below, omitting the MA20 acres for which the Forest Service had no information or did not fit any old growth definition. The recalculated tally of *existing*[9] old growth is very different:

OGAA	03050102	03050110	03050112	03050115	03050116	03050118
OGAA total size (NFS lands)	6519	9981	13028	7282	10303	6779
OGAA forested acres	6008	9397	12535	6911	9661	6302
FPOG	127	145	325	338	165	40
NIOG	322	78	116	40	94	331
NIOG/FPOG	53	492	0	220	0	0
Existing OG	512	715	441	598	259	371
% existing over OGAA forested acres	8.5%	7.6%	3.5%	8.6%	2.7%	5.9%

As you can see from an appropriate calculation, the average existing old growth in this project area is 6.1%. If this is representative of the forest-wide average, the agency has some problems. When existing old growth is below the 5 percent minimum for the drainage (OGAA), then the forest plan requires the Forest Service to allocate acres from adjacent drainages that have excess old growth to meet this standard. This not only means the agency cannot log old growth in the

[8] Old Growth Analysis Area, which the Forest Service treats as the watershed-areas in Appendix N of the Forest Plan.
[9] The forest plan does not permit the Forest Service to use old-growth replacement to count towards its old growth standards, which is described further below.

deficient drainages, but allocating acres from drainages with excess old growth to compensate might mean there is few acres of excess old growth that could be available for logging in OGAAs that meet the minimum 5% standard in this project. Failing to address these analytical deficiencies means failing to take the hard look that NEPA requires and failing to comply with the forest plan.

Table 3-50 also violates the forest plan's direction on old growth because replacement old growth cannot count towards meeting existing old growth requirements. Appendix N is very clear that there must be five percent old growth within each prescription watershed (the old growth analysis area) and an *additional* five percent of forested acres should be designated as replacement old growth. When one corrects Table 3-50 to omit the MA-20 areas that don't clearly have old-growth and then calculates for only replacement old growth, there is at least one OGAA that doesn't meet the five percent replacement old growth. This also fails to take a hard look at impacts under NEPA and violates the forest plan requirement to set aside five percent old growth in several OGAAs.

This table violates NEPA in disclosing high quality information to the public because it counts MA-20 acres as old growth even when there is no evidence they qualify as old growth and because it counts replacement old growth as existing old growth even against clear forest-plan direction not to do so.

Finally, the FEIS fails to adequately analyze the impacts of logging on old growth. Even if large-diameter, oversized trees are retained, other old-growth characteristics are going away with logging, including downed woody debris. Old growth is an ecological community resulting from decades of natural processes, and the legacies from fire and insects remain in the form of dead and dying trees that create habitat for species.[10] The FEIS fails to address how it is changing ecological responses given the project removes dead or dying trees and prevents allowing trees to die.[11] Snags won't be created.

2) The Forest Service has not demonstrated that the project is in compliance with forest plan Appendix N. There is no evidence that the Forest Service has validated old growth on-the-ground, as required by the forest plan.

We demonstrated our concern with logging old growth, and the levels of old growth on the forest as demonstrated by the comments under the OLD GROWTH heading as well as the comments above. On pages 31-32 of our comments, we commented on and asked about the on-the-ground conditions in MA20 areas in addition to areas the Forest Service labeled as North Idaho old growth or forest plan old-growth. We noted that the Forest Service acknowledged that field reconnaissance demonstrated inconsistencies between MA20 designations and what is present.

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[10] Spies, T. 2003. *New Findings about Old-Growth Forests*, USDA, Forest Service Pacific Northwest Research Station; Lidenmayer and Franklin 2002. Conservation Biology, Ch. 4 *Using Information about Natural Forests, Landscapes, and Disturbance Regimes* pp. 55-60.
[11] Franklin et al. 1987. *Tree Death as an Ecological Proeces: The causes, consequences, and variability of tree mortality*, BioScience Vol. 37(8) pp. 550-556.

We also asked what the agency meant by "validation of MA 20." We asked about surveys in the project area and whether they have been thorough.

Appendix N of the Nez Perce Forest Plan requires the FS to identify old growth stands by using three strategies in tandem: stand exam information, aerial photos, *and* field reconnaissance.

If the MA20 qualities in Table 3-50 are unknown, and these areas had been originally set aside for old-growth management, then the agency has not validated potential old-growth. As stated above, in the FEIS, the Forest Service noted that

> [S]ome stands labeled as MA20 are not labeled as [Forest Plan Old Growth (FPOG)] or [North Idaho Old Growth (NIOG)]. Not all areas have stand exams and, as stated above, the validation process relies on additional information other than stand exams to allocate management areas within each capability area. This fact does not indicate stands labeled as MA20 alone are not old growth. Those stands simply lack stand exam data and cannot appear in the query performed to locate NIOG and FPOG.

Hungry Ridge FEIS, Chap. 3, p. 260. There wouldn't be unknown areas if the agency verified existing old growth.

Even the wildlife report demonstrates that the only project-area old-growth identified were the areas the agency wants to log:

> Forest Service vegetation data and computer mapping tools were used to identify *potentially affected habitats* in the project area. Existing habitat condition was determined by extracting information from Forest Service databases; aerial photo interpretation; field reconnaissance; GIS mapping, data tables, and analyses of satellite imagery; VMap 2014 dataset; stand exams (2014), and data presented in the South Fork Clearwater River Landscape Assessment (USDA 1998).

Hungry Ridge Wildlife Report, p. 8 (italics added). Of course the agency needs to identify old growth in the area it wants to log. However, just as importantly, the agency needs to identify old growth in the areas that aren't proposed for logging. Without verifying this old growth with on-the-ground surveys, there is no guarantee that the old growth the agency assumes is there is really there. The Forest Service supports this position by the following tables, one of which is Table 3-52 and demonstrates the *reduction* in old growth after treatments.

The footnote to 3-52 is also incorrect. The Forest Service states that,

> Calculation of old growth acres remaining is conservative. Calculation does not include acres of old growth that are proposed for shelterwood harvest, which can still meet old growth definitions.[12]

[12] Hungry Ridge FEIS Chap 3 p. 271, footnote 5 to Table 3-52.

We applaud that the Forest Service omitted counting shelterwood-cut acres in the remaining old-growth category, but the agency misleads the public when it states that shelterwood cuts do not eliminate old-growth criteria. Without correcting this and being honest about what shelterwood cuts do, the Forest Service is not disclosing to the public true effects of the project and not giving the public the high quality of information necessary to demonstrate that the agency has complied with NEPA.

Below are post-monitoring pictures of the Orogrande Community Protection Project in an area that used to have roadless characteristics. The units depicted in these pictures were all shelterwood cuts.

These pictures do not match the plain-language description of old growth in Appendix N of the Forest Plan. The Forest Service needs to disclose and acknowledge that shelterwood "treatments" will eliminate old growth. Anything less violates the high quality of information that the agency owes to the public.

3) The Forest Service has not evaluated and ranked its old growth or has considered scientific information on the importance of patch size needed by the wildlife that depends upon old growth.

Pages 31-33 demonstrate our concern with whether the Forest Service is meeting its forest-plan old growth requirements. This means compliance with everything Appendix N requires. There is no evidence that this agency has evaluated and ranked *all* project area old growth as required by Appendix N of the Forest Plan. We've included a declaration provided by Gary Macfarlane that includes examples where the Forest Service has followed its own forest plan in the past. Without evaluating and ranking, the agency has no way of knowing whether it is saving the best quality habitat for the species dependent upon this habitat. There are size components to ranking, and there is no evidence from the project that the computer programs using to "identify" old growth are considering size. For example, a computer-generated and then field-verified block of 300 acres might fit into what the forest plan considers old growth, a five-acre area would not.

Without evaluating and ranking all old growth in the project area, the Forest Service cannot demonstrate it is complying with its own forest plan. Because the agency has not followed its own forest plan, it cannot conclude whether it is eliminating the highest quality old-growth habitat, which is a failure to take a hard look at a project.

The EIS does not consider scientific information on the patch size of the old-growth habitat to minimum sizes needed for utilization by old-growth associated wildlife.

To add to this, it is very much likely that treatment in old growth will eliminate it. On page 32 of our comments, we asked how many acres of treatment would eliminate the features that make up old growth criteria. The treatments described, if effective as the Forest Service plans, will eliminate the old growth characteristics outlined in Appendix N. And without monitoring to evaluate the impact of treatment in old growth, the impact of opening up understory for the wildlife that use old-growth habitat is unknown at best.

4) Forest plan and Hungry Ridge old-growth direction and analysis is not using the best available science for old growth.

We provided a list of the best available science for the Forest Service to consider for old growth habitat needs on page 32-33 of our comments. We also asked how many FIA plot surveys meet the old growth criteria (which includes a minimum size requirement). The Forest Service refused to consider some of this science, and is not using the best available science, claiming that the science we introduced was outside the scope of the project. The Forest Plan requires basement-level old-growth percentages, there is no requirement that prevents the agency from considering that these minimum numbers might severely underestimate habitat for population viability. It is especially problematic because the Forest Service has proposed to log in old growth for this project. So, to the extent the Forest Service refuses to consider this science and what it might mean within project boundaries, the Forest Service fails to take a hard look at impacts, and fails to consider and disclose high-quality information to the public.

Lesica (1996) believes that the Forest Plan's reliance upon a 10% old-growth Standard could result in extirpation (i.e., loss of viability) of some species. This is based on an estimate of 20-50% of low and many mid-elevation forests being in old-growth condition prior to European settlement.

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.

For the Hungry Ridge analysis, 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, one of those being that the FIA data do not determine the size of any particular old-growth stand.

FIA inventory that might meet the characteristics of old growth listed in the forest plan, but FIA inventory cannot inform the acres of old growth present, and the forest plan imposes a minimum acre size. So, the Forest Service cannot rely on FIA inventory to prove that it is meeting its old growth requirements. 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." As Forest Plan Appendix N indicates, the Nez Perce

NF has one of those Plans with minimum old-growth stand size requirements. Despite that, 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.

It also appears the FS may be using the Green et al. criteria for evaluating FIA plots—not the Forest Plan criteria. The Wildlife Specialist Report states:

> The most recent Forest Inventory and Analysis (FIA) data (Bush et al. 2010) indicate that approximately 13 percent of the Nez Perce National Forest meets the definition of “north Idaho old growth” (90 percent confidence interval: 10.4 - 15.6 percent) based on the Green et al. 1992 definitions (minimum of 8 trees per acre greater than 21 inches dbh, minimum of 40 square feet basal area per acre, and at least 150 years old). Approximately 13.6 percent of the Nez Perce National Forest meets the Forest Plan definition of old growth (minimum of 15 trees per acre greater than 21 inches dbh) (90 percent confidence interval: 14.4 - 20.2 percent). Based on this information, the Nez Perce National Forest is above the Forest Plan minimum standard of 10 percent old growth forest-wide.

However, this is an over-simplification of the Forest Plan old-growth criteria. Appendix N actually states:

> Old-growth stand refers to a stand of timber that, generally, meets the following criteria:
> 1. At least 15 trees per acre ≥21 inches diameter at breast height (DBH). Providing trees of this size in the lodgepole pine and sub-alpine fir stands may not be possible.
> 2. Two or more canopy layers.
> 3. At least .5 snags per acre ≥21 inches DBH and at least 40 feet tall.
> 4. Signs of rot and decadence present.
> 5. Overstory canopy closure of 10-40 percent; understory canopy closure of at least 40 percent; total canopy closure at least 70 percent.
> 6. Logs on the ground.

And again, this percentage claim also totally ignores the size of the plots vs. the stand size based more closely upon biological needs of old-growth associated wildlife, as Appendix N recognizes,

> Where available, stands should be at least 300 acres. Next best would be a core block of 150 acres with the remaining blocks of no less than 50 acres and no more than 1/2 mile away. If existing old-growth blocks are less than 100 acres, the stands between the old-growth blocks should be designated old growth replacement. The entire unit consisting of old-growth blocks and replacement old growth should be managed as an old-growth complex. If the old-growth component is less than 50 percent of the complex, the complex should be considered replacement old growth. Within the old-growth complex, only the stands that meet old-growth criteria will be counted toward meeting the allocation for existing old growth. The replacement stands will be counted toward meeting the allocation for replacement old growth.

The EIS does not disclose the historical range of variability (HRV) for old-growth habitat on the Forest and in its failure to analyze cumulative effects it fails to disclose how much old growth has been destroyed or degraded in the Forest or Project Area. The Overview for Wildlife Specialist Report, states that

> 29% of the project area (Forest Service administered lands, approximately 29,383 acres) has been previously harvested in the past 56 years. Old regeneration harvests have reduced the availability of standing snags and down wood. The size of the early-seral habitats (pole and younger) may create conditions that are not suitable for use by some wildlife species due to the decrease of canopy cover.

The FS has not analyzed the wildlife viability implications of managing the Forest well outside the HRV for old growth, based upon the best available scientific information.

The EIS doesn't disclose how the designated "replacement" old growth was determined to meet Forest Plan criteria. In any case, "replacement old growth" is pretty meaningless. The Forest Plan allows a very liberal interpretation that for such stands, they must be old growth within 100 years but includes no other species habitat component requirements.

USDA Forest Service 1987a considers smaller patches of old growth to be 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 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**. (Bold emphasis added.)

The defining characteristics of old growth are acknowledged by Green et al., 1992:

> 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.

Green et al., 1992 also recognize that "Rates of change in composition and structure are slow relative to younger forests."

In adopting Green et al. 1992 old-growth guidelines, R-1 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's 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 points out the scientific inadequacy of maintaining merely "minimum" amounts of old-growth habitat and its components such as snags.

It seems the FS wants to make the definition of old growth to be a simplistic numbers and database analysis game, devoid of biologically vital data gathered in the field which might document what is unique about old growth—not just a few large trees left over after logging, but decadence, rot, snags, down logs, patchy irregular canopy layers—things that can't be created by the agency's version of "restoration" and which would be depleted by such management actions as Hungry Ridge.

The IPNF's 1987 Forest Plan also included standards for protection of old growth and associated wildlife (USDA Forest Service 1987c). 1987 Forest Plan Appendix 27 (USDA Forest Service, 1987d) provided other direction and biological information concerning old growth and old-growth associated wildlife species.

Likewise the Kootenai National Forest's 1987 Forest Plan included standards for protection of old growth and associated wildlife, along with Appendix 17 (USDA Forest Service 1987a, USDA Forest Service 1987b).

We incorporate USDA Forest Service, 1987a as well as USDA Forest Service, 1987b which contains a list of "species …(which) find optimum habitat in the "old" successional stage…" We also incorporate Kootenai National Forest, 1991 which 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." USDA Forest Service 1987a, and USDA Forest Service 1987b also provides biological information concerning old growth and old-growth associated wildlife species.

The NPCNF 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. For the above reasons, the agency has not considered the best available science and has not taken a hard look at the impacts of reducing old growth further.

Remedies related to all old-growth objections
1) Choose the no-action alternative or drop the project; or
2) Re-analyze the impacts to old growth in a manner that addresses the issues raised above.

THE ELK ANALYSIS IS DEFICIENT

In our scoping comments, we stated that the project must comply with all Forest Plan standards and objectives. We took issue with the elk analysis on pages 37-39 of our DEIS comments, noting specifically opaque language that made it difficult to understand whether the project was consistent with the forest plan. We also noted that the agency, based on existing condition of elk habitat effectiveness that we could see in the draft EIS, had no intention to meet unit objectives for elk needs. We also noted that the draft EIS failed to explain how such high project-area road densities are acceptable. We have finally been able to see some the analysis behind these conclusions, and object because Forest Service has made several mistakes in calculating elk habitat effectiveness according to the Nez Perce Forest Plan. We think the agency is not meeting its forest plan standards and objectives, and is not taking a hard look at its proposed impacts.

The Forest Service has to calculate EHE with Appendix B, not VMap, and is not using the correct forest plan formula for calculating elk habitat effectiveness

The Forest Service is violating the forest plan with using VMap in elk habitat effectiveness calculations, and neither discussed those nor disclosed those in the environmental impact statement. We took issue with EHE calculation in our comments on page 37. In the final EIS, Chapter 3, p. 251, the Forest Service presented new information as one of the changes between the draft and final EISs was an "Updated elk habitat effectiveness calculations to be more quantitative using VMap." Information introduced into the final EIS, this is new information. The Forest Service is violating the Forest Plan by using VMAP for elk habitat effectiveness calculations. The Nez Perce Forest Plan sets a forest-wide standard to use Appendix B to assess the attainment of elk habitat objectives, which include formulas on elk habitat effectiveness.

In complying with the forest plan, the Forest Service has to "Use 'Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho" to manage for and to assess the attainment of summer elk habitat objectives in project evaluations (see Appendix B of Forest Plan).'" This appendix B contains worksheets identical to Servheen et al. 1997. An excerpt from "Form 1" of Servheen et al. is below, and this same excerpt can be found in the forest plan at Appendix B, p. 26:

FORM 1

Calculated by: ______________________ AREA: ________________

Date: ______________________ ALTERNATIVE: ____________

ESTIMATING QUALITY OF ELK SUMMER HABITAT IN NORTHERN IDAHO

1. Total size of evaluation area in usable acres[1] ____ (A); and square miles (A÷640) ____(B)
2. Potential elk use as affected by roads.[2]

		Vegetation Adjacent to Roads					
		Hiding Cover			Open		
Road Type	Road Status	Miles (C)	Coeff. (D)	Std. Miles (C x D) (E)	Miles (C)	Coef. (D)	Std. Miles (CxD) (E)
Arterial/Collector	Open	____	.80	____	____	1.20	____
	Closed w/ gates	____	.24	____	____	.36	____
	Closed w/ barrier	____	.08	____	____	.12	____
	Closed completely	____	.00	____	____	.00	____
Local	Open	____	.50	____	____	.90	____
	Closed w/ gates	____	.15	____	____	.27	____
	Closed w/ barrier	____	.05	____	____	.09	____
	Closed completely	____	.00	____	____	.00	____
Temporary Road & System Trail	Open	____	.03	____	____	.07	____
	Closed w/ gates	____	.01	____	____	.02	____
	Closed w/ barrier	____	.01	____	____	.01	____
	Closed completely	____	.00	____	____	.00	____

Subtotal Std. Miles ________ (F) ______(F)

Total Std. Miles (F+F) ________(G)

Miles of standard road per square mile (G÷B) ______(H)

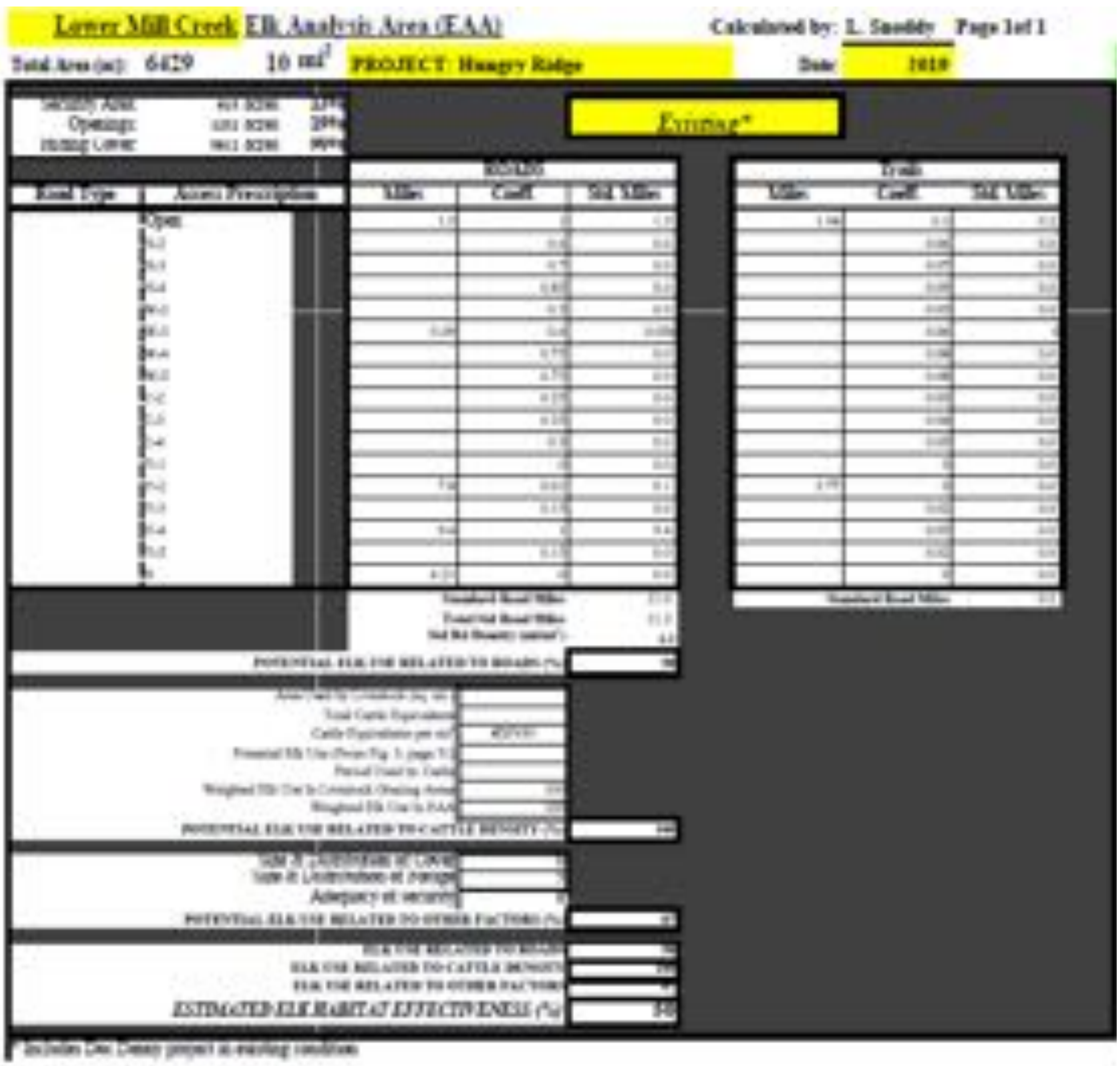
Percent of potential elk use after road effects [use (H) and Fig. 2] ______(I)

There is a calculation that must be done to adjust all roads to a standard number in order to evaluate existing conditions and impacts to elk. According to the above form, which is required by the forest plan (Appendix B), to get to a "standard mile," one has to multiply road mileage by one of two possible coefficients for roads, one for mileage that traverses hiding cover[13] adjacent to the road, and one for mileage where an opening that borders the road. As seen in the above excerpt, for Arterial/Collector roads where the road status is "Open," mileage is supposed to be

[13] "Vegetation must be dense enough to qualify as hiding cover within 300 feet on both sides of road or it is classified as open." Servheen et al. 1997 p. 26.

calculated by the .80 coefficient if the road has hiding cover adjacent to the road. But, one is supposed to use the coefficient of 1.20 if there is an opening adjacent to the road, which would apply if, for example, a segment of road borders or cuts through the clearcut. Servheen et al. directs one to apply the calculation on pdf p. 72 to the graph, Figure 2, on Servheen et al. pdf p. 43.[14] The higher the open road density on this graph, the lower the percent of potential elk use.

However, in the various elk analyses that we found for this project, *see* Lower Mill elk habitat effectiveness calculation (doc. 10ja-0048 in the project file) below, every category of road and system trail had one coefficient, and not two depending upon the presence or absence of hiding cover.



Lower Mill Creek Elk Analysis Area (EAA) Calculated by: L. Snoddy Page 1of 1

Total Area (ac): 6429 10 mi² PROJECT: Hungry Ridge Date: 2018

Existing*

Open

ESTIMATED ELK HABITAT EFFECTIVENESS (%)

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[14] So does the Nez Perce forest plan, Appendix B, p. 23

This problem is pervasive in all the agency's elk analyses for this project; there aren't two coefficients for roads, so roads next to openings and the ones next to hiding cover are treated identically, which is not accurate according to the scientific process that the agency recognizes or the formula that the forest plan requires the agency to use. This doesn't measure the existing condition (and resulting elk habitat effectiveness) accurately, and it doesn't measure the alternatives' impacts accurately. None of this was disclosed or discussed in the EIS. For these reasons, this isn't a hard look under NEPA and incorrect calculations using a formula different from what the forest plan requires cannot show compliance with the forest plan, in violation of NFMA.

There also seems to be missing a disclosure (including mapping) of how the logging units will impact the size and distribution of hiding and thermal cover, the size and distribution of security areas, and the size and distribution of forage areas. Appendix B has a process and gives examples. Numbers do not mean anything to the public unless we can see how they are spaced across the landscape. While there is a map of logging units, we didn't see one that overlays with the elk analysis units, a map or overlay of an aerial photo that discusses, according to Appendix B, what is hiding cover, and there wasn't a discussion on how logging would fragment habitat for elk. Given that there are so many 40+ acre openings, it is important to consider the spacing, and it is not clear to the public that the agency has done that.

Without these considerations, disclosures, and discussions, the analysis for this project violates the forest plan, does not take a hard look at the impacts of the project required by NEPA, and fails to disclose a high level of information to the public (also required by NEPA), who the agency is leaving in the dark.

The Forest Service failed to account for or explain cattle in its elk habitat effectiveness

Forestwide standard for wildlife requires using Appendix B to manage for and assess the attainment of summer elk habitat objectives. Appendix B of the forest plan requires accounting for cattle density in terms of how it impacts elk use. The EIS discusses "increased transitional grazing opportunities" for livestock. The End of the World EA (a project close to this one), noted that "implementation of concurrent projects (Hungry Ridge and Doc Denny) will have a greater impact of grazing allotment management and permit administration." End of the World EA p. 18. Yet there is no discussion or analysis of how this impact will, in turn affect elk. There is a "#DIV/O!" on every analysis area worksheet. There is no break down of what areas the cattle use when—averaging them across the landscape will likely come up with negligible impacts as opposed an analysis that would consider them in the much narrower acres where they spend time.

Without these considerations, disclosures, and discussions, the analysis for this project violates the forest plan, does not take a hard look at the impacts of the project required by NEPA, and fails to disclose a high level of information to the public (also required by NEPA).

The Forest Service cannot use the travel plan alternatives for analysis when there is no travel plan decision

We object to the Forest Servicing using travel plan alternatives in its analysis. We raised this issue on page 38 of our comments. There has been no decision on the travel plan, and until we see one, any analysis using an alternative from the travel plan is speculation. This shouldn't be figured into the Forest Service's reasoning or decisionmaking at all.

Any decision made upon analysis under an alternative not yet chosen is not a hard look at the likely impacts, and violates NEPA.

No adequate cumulative effects analysis

On page 38 of our comments, we stated, "The existing condition of EHE, if the numbers can be believed, indicate the FS has no plan to meet all Unit objectives." There has been no analysis as to whether the forest is meeting its forest-wide goal on timber management lands (MA 12). The forest plan outlines the goal for managing 109,444 acres to achieve at least 75 percent habitat potential, 310,544 acres to achieve at least 50 percent habitat potential, and 114,225 acres to achieve at least 25 percent of habitat potential, and then directs the analyzers to Appendix B. There is nothing on whether this goal is being met. Given the uptick in projects in the recent years (including the neighboring Doc Denny and End of the World projects), assessing whether the agency is even close to attaining these goals is integral to a hard look at the environmental impacts as required by NEPA, as the disclosure to the public. Neither is the case here, and for those reasons this project violates NEPA.

FAILURE TO MONITOR AND CONSIDER CUMULATIVE EFFECTS

Monitoring is an issue that we raise in all of our project comments, and this one is no exception. We continue to raise it because the Forest Service fails to do it, and as a result, the agency moves further and further away from any idea of what kind of impact its actions have. We described, on pages 24-25, how the DEIS fails to integrate the results of past monitoring from other projects and the forest plan into this project's analysis. Our concerns with monitoring were also raised in connection with fish and aquatic habitat (pp. 4, 14), past projects (p. 6), and even work meant to be restorative (p. 11). Our concerns also relate to the Forest Service's apparent refusal to monitor changing sediment levels from this project (p. 14). Monitoring is both a requirement of the Nez Perce Forest Plan and the high-quality information owed to the public and necessary for a hard look at the true impacts of the project. Without monitoring, the agency has violated NEPA because it hasn't examined, considered, or analyzed a true hard look at its analysis. Without monitoring, the agency hasn't disclosed the quality of information to the public that NEPA also requires.

The Forest plan requires annual evaluations of monitoring. In response to our comments on monitoring, the Forest Service stated that "Many of the monitoring items listed include surveying of natural and cultural resources that was used in the effects analysis"; "A summary of the monitoring/inventory has occurred in the project area"; and "Forest Plan monitoring reports are available online here: Nez Perce National Forest: https://www.fs.usda.gov/detail/nezperceclearwater/landmanagem ent/planning/?cid=fsm91_055807." FEIS Appendix F p. 119. Our objection starts with your forest plan monitoring reports. According to the webpage above, the last time the Forest Service published a Nez Perce National Forest Annual Monitoring Report was 2003-2004.

Monitoring is not the same as surveying. The response to our comment of pp. 24-25 of our DEIS comments suggests the Forest Service is treating these two activities as synonymous with each other. Surveying ascertains an existing condition. *Monitoring* helps measure a cause-and-effect relationship—it is how the Forest Service was supposed to ascertain whether the proposed projects were having (or avoiding) intended effects.

The Forest Plan itself is in total accord with what we're arguing here. Chapter V, which calls monitoring and evaluation the "management control system" for the forest plan, states the following:

> Monitoring and evaluation entails **comparing the end results being achieved to those projected in the Plan**. Costs, outputs, and environmental effects, both experienced and projected, will be considered. **To do this, a comparison will be made, on a sample basis, of overall progress in implementing the Plan as well as whether the overall relationships on which the Plan is based have changed over time.** When changes occur, they will be evaluated as to their significance, and appropriate amendments or revisions made.
>
> The goals for monitoring and evaluating this Forest Plan are to determine:
> 1. How well the Forest is meeting its planned goals and objectives;
> 2. If existing and emerging public issues and management concerns are being adequately addressed;
> 3. How closely the Forest Plan's management standards are being followed;
> 4. If outputs and services are being provided as predicted;
> 5. If the effects of implementing the Forest Plan are occurring as predicted, including significant changes in the productivity of the land;
> 6. If the dollar and manpower costs of implementing the Forest Plan are as predicted;
> 7. If implementing the Forest Plan is affecting the land, resources, and communities adjacent to or near the Forest;
> 8. If activities on nearby lands managed by other Federal or other governmental agencies, or under the jurisdiction of local governments, are affecting management of the Forest;
> 9. If research is needed to support the management of the Forest, beyond that identified in Chapter II of the Forest Plan; and
> 10. If there is a need to amend or revise the Forest Plan.

Nez Perce Forest Plan, Chapter V, p. 4-5. Surveying the existing condition without some kind of context and analysis (i.e., a prior condition before implementing a project or knowledge of a general comparison for specific projects in the same management areas across the forest) does not achieve the goals of monitoring. There is no comparison to pre-projects or some kind of general comparison between the before-and-after of projects in specific management areas

Chapter V also 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.

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

The forest plan has outlined the monitoring requirements and their frequency for each management area. If we rely upon the information the agency has given us, this hasn't been done since 2003-2004, which is a violation of the plain language of the forest plan. Practically speaking, it means the FS apparently has no idea how well past FS projects met the goals, objectives, desired conditions, etc. stated in the NEPA documents, and how well the projects conformed to forest plan standards and guidelines.

Monitoring is a critical part of the NEPA analysis. Without this critical link the validity of many FS assumptions are baseless, rendering conclusions completely arbitrary. 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 the current proposal. The predictions 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 process will 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 or prescribed fire have not been monitored appropriately, then the agency does not have support that this project could or would "[r]restore a more diverse and resilient forest structure," "[r]educe potential risk to private property and structures," and "[i]mprove wildlife habitat structure, function and diversity,"[15] and there is no valid justification for this project.

The deficiencies of required Forest Plan implementation monitoring make it impossible for the public to gauge whether the agency might really have the impact it is assuming it will. The FS is operating in the dark.

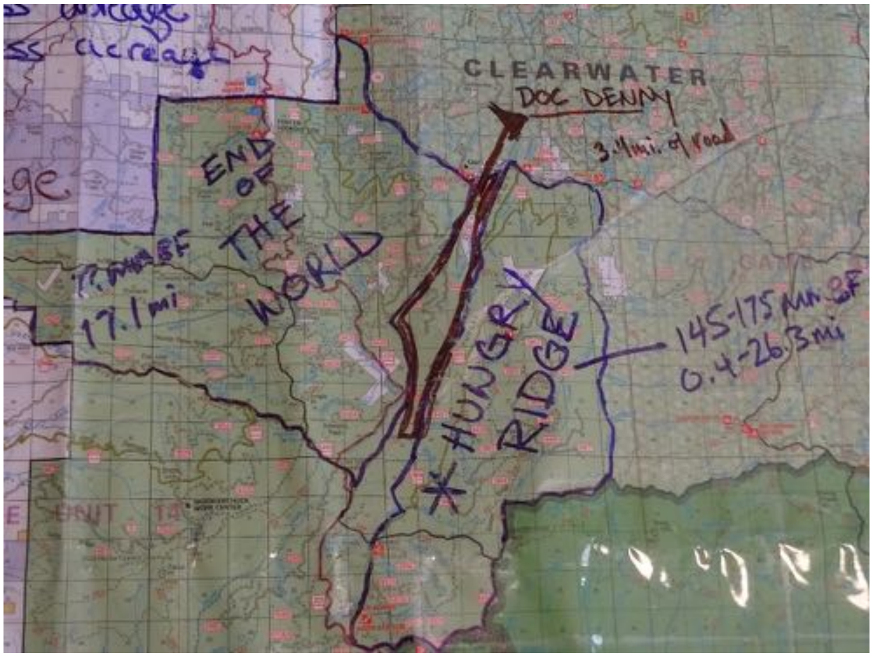
Forest Plan Chapter V states, "The Forest Supervisor shall review the conditions on the land covered by the Plan at least every 5 years to determine whether conditions or demands of the public have changed significantly." This is another mandate for information, and another mandate ignored by the Forest Service.

The cumulative impacts discussion is also insufficient. We raised our concerns with properly assessing cumulative impacts on pages 2 and 3 of our 2014 scoping letter and on pages 3 (winter motorized travel, 5 (PACFISH quantitative cumulative analysis), 6 (cumulative sediment and fisheries impacts), 10 (failing culverts), 13 (neglect of regular maintenance on roads), 24-25 (cumulative effects that includes the results of forest-plan monitoring), 25-26, 30 (cumulative effects with livestock), 29-30, 32, 33 (cumulative effects on wildlife from timber harvests, including habitat fragmentation, old growth, and snags), 30 (cumulative effects of roads), 34 (cumulative effects of lynx, black-backed woodpecker, and Townsend's big-eared bat), 38 (cumulative impacts for travel management), 44-45 (cumulative impacts to rare plants, including as a result of grazing), 49 (cumulative effects of FS fire suppression policies), 51 (cumulative carbon emissions), and 51 (cumulative effects of carbon sequestration). Not only does the lack of forest plan monitoring create gaps in all of the above, but a lack of the project-specific monitoring in the same area causes gaps in knowledge, preventing any kind of sufficient analysis.

The project-specific monitoring that could inform cumulative impacts is missing. Where is the project-specific monitoring? Doc Denny had some effectiveness monitoring to determine if design features achieve desired objectives for invasive plants, PACFISH compliance, and implemented conditions compared with desired project outcomes. pdf p. 24 (Chap 2 p. 18 of Doc Denny EA). Even though Doc Denny is ongoing, which means some logging has been done, monitoring done thus far could inform on sedimentation, yet Hungry Ridge FEIS doesn't account for any of this monitoring. Likewise, the Forest Service incorporated PACFISH implementation and effectiveness-of-treatment monitoring and post-harvest soil monitoring into the Adams Camp Project. Yet, instead of discussing the monitoring done and whether the monitoring matched assumptions, sections such as the FEIS watershed and aquatics analysis used Adams Camp and Doc Denny's "projected immeasurable changes." Without a discussion on the actual impacts monitoring as these projects promised, this analysis lacks substance and doesn't comply with NEPA's "hard look" requirement with water issues or soil issues.

Below is a map of the region with contiguous project boundaries. We have provided the NEPA documents.

[15] Hungry Ridge FEIS Purpose and Need Section.



Doc Denny is a 4,280-acre project area, analyzed in 2012-13, and that authorized 1,026 acres of "forest management activities" (Doc Denny DN-FONSI p. 1). This project included regeneration harvest of 763 acres, 3.4 miles of temporary roads, commercial thinning of 197 acres, and 40 acres of pre-commercial thinning, and all of the impacts that these activities have on the land. Some of this project has been implemented, but it does not seem to be done.[16] The EIS really did not discuss this project even though it borders the Hungry Ridge project boundary. The EIS also did not discuss the amount of work that has been completed nor the amount of work that remains. We just don't know, which adversely impacts the comments we can provide and certainly does not give the Forest Service the level of information it needs to take a hard look at what happens when this project's impacts are considered with those from the Hungry Ridge project.

The Forest Service has insufficiently and poorly discussed foreseeable future actions under its cumulative effects analysis. This violates NEPA's hard look at possible impacts as well as the duty to disclose to the public quality information. Contiguous and to the west of the Doc Denny project is the End of the World project boundary. End of the World is approximately a 49,565-acre project proposal with proposals to log up to approximately 18,000 acres.[17] We could not find in the EIS where it describes the size of this project. We also could not find where the Forest Service discussed the size and status of the Adams Camp project or the Dixie Comstock project. Just listing these projects is not a sufficient discussion of foreseeable future actions, especially when some of these projects have more defined scopes and actual acreages the Forest Service has proposed logging.

Given that End of the World borders Doc Denny, and Doc Denny borders Hungry Ridge, there are probably some regional impacts, especially since there will be far more acreage directly

[16] *See* Idaho County Free Press, *Doc Denny timber sale work continues, weekday road closure in effect despite shutdown* (Jan. 2, 2019).
[17] End of the World EA-draft FONSI and maps.

impacted by the End of the World project. Has the agency done any monitoring from the Doc Denny project, or is the agency relying on the same forecast without assessing the impacts of what has already been done?

Overall, the agency has ignored these cumulative effects, which violated NEPA in the hard look the agency must take as well as the quality of information it discloses to the public.

Remedy:
1) Select the No Action alternative;
2) Drop the project;
3) Acquire the necessary monitoring, consider the cumulative impacts from that monitoring, and reanalyze the issues in a way that addresses the problems above.

ROADLESS/WILDERNESS

Our comments went into detail the issue for several pages. While the agency recognized, as a result of our comments, the roadless[18] character of some of the area that constitutes the larger contiguous roadless area[19] to the Gospel-Hump Wilderness and apparently[20] dropped portions of logging units from this area, it appears that some logging is still proposed in this area. Thus, we have concerns.

Introduction and Background:

Forest Service Definitions

There are some major problems with the analysis starting with the definition of roadless FEIS. It states:

> The term "Roadless" area refers to an area of at least 5,000 acres, without developed and maintained roads and is substantially natural in condition. **A Roadless area is specifically defined as an area that meets the minimum criteria for wilderness** (USDA, Forest Service 2015a, FSH 1920.12, Chapter 71.2). **Unroaded lands typically share similar characteristics and are often smaller.** Unroaded areas contiguous or adjacent to Roadless/Wilderness areas are analyzed the same as designated Roadless areas.

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[18] Throughout this discussion, we use the term roadless to refer to all roadless lands, be they what the Forest Service terms unroaded, lands that may have wilderness characteristics, the larger roadless expanse, or inventoried roadless areas unless the discussion is specific to the unnecessarily artificial distinctions the Forest Service has made between these areas.
[19] We have provided a general map of this area, minus a few minor fingers to draw a more recognizable proposed wilderness addition boundary in the attachments along with more detailed topo maps that show all of the important roadless lands plus an explanation of the maps.
[20] Later in this objection point we raise the issue of the inconsistent information about roadless logging from the proposed action.

FEIS at 246, emphasis added. The first problem above is that a real roadless area is not referred to as such, erroneously, in our opinion, in the Forest Service chapter cited above. Rather, the Forest Service, in its barely coherent policy, identifies roadless areas as only those areas covered under one of the roadless rules. Chapter 71, cited above, specifically states at 71, "The primary function of the inventory step is to efficiently, effectively, and transparently identify **all lands in the plan area that may have wilderness characteristics** as defined in the Wilderness Act." Emphasis added. Indeed, the discussion in the FEIS at 246 proves that even the Forest Service becomes confused about the artificial distinctions it established for various categories of roadless areas.

Furthermore, the above referenced statement from page 246 may lead a reader to conclude that only areas the Forest Service terms *roadless areas*, which are apparently a subset of what is truly roadless, are the only ones the agency believes "meet(s) the minimum criteria for wilderness," thereby eliminating or downgrading the portions of the larger roadless area within the project boundary. Our objection elaborates on the agency's lack of clarity.[21]

The idea that unroaded lands are typically smaller ignores on-the-ground conditions. Roadless areas the Forest Service terms *unroaded* are usually the result of the fact that most, if not all of these areas, are part of a larger roadless area, because they are contiguous to recognized roadless areas, existing Wilderness, or roadless land administered by another agency. In most or all of these cases, the reason the so-called *unroaded* lands were not part of formal roadless inventories were the result of Forest Service failures in properly identifying roadless boundaries in past inventories.[22] There has been a history of the agency doing this since the 1970s. That is similar to the case here, where roadless lands contiguous to the designated Gospel-Hump Wilderness were erroneously not recognized as roadless in either the Idaho Roadless Rule or the draft revision of the Forest Plan even though they were recognized as such in RARE II.[23]

Lastly, the inconstancy in the way the Forest Service has evaluated and considered what kinds of actions negatively affect roadless areas so that boundaries should be redrawn to remove recently completed development activities (usually timber sales) has created a policy quagmire. For example, a portion of one inventoried roadless area--the West Fork Crooked River Roadless Area—was recently logged even though the agency claims this area still has roadless and wilderness characteristics. This contrasts with areas that may show little or no evidence of past development the agency claims still lack these characteristics. These failures at adequate analysis of logging and roadbuilding on wilderness and roadless characteristics have been documented in the Friends of the Clearwater Roadless Report[24] our past comments, and in the subheadings below.

Identifying the Roadless Boundary

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[21] Indeed, the DEIS did not recognize anything west of Johns Creek being in this larger roadless area.
[22] See our attached roadless report.
[23] See attached in the roadless folder forest plan comments.
[24] Attached.

While the FEIS has improved on the DEIS in terms maps, the roadless boundary in the FEIS is still lacking in some key respects. Our comments stated in reference to the 2010 roadless expanse direction from the regional office:

> It states that "projects on lands contiguous to roadless areas must analyze the environmental consequences, including irreversible and irretrievable commitment of resources on roadless area attributes, and the effects for potential designation as wilderness under the Wilderness Act of 1964. **This analysis must consider the effects to the entire roadless expanse; that is both the roadless area and the unroaded lands contiguous to the roadless area**."(Emphasis added.) The DEIS fails to include such an analysis.

While we go into more detail in the following subheadings of this objection point about roadless logging, the FEIS and associated materials do not provide a map of the larger roadless expanse. Rather the maps provided for the various alternatives only include the project area without the context of the larger map, and then only the part of the project area affected by logging. Specifically, the Forest Service does not consider prescribed fires to have negative impacts on roadless areas. Indeed, an analysis of prescribed fire is absent in the wilderness roadless section of the DEIS and FEIS.[25] We also noted in our comments:

> The DEIS refers to an "unroaded area" (not officially inventoried) and in multiple places, mentions its "boundaries". Yet what the FS is talking about in referring to any such "boundary" is extremely vague because the DEIS provides no maps of the unroaded area or its "boundary." The best description found in the DEIS is, "a tract of unroaded land lies contiguous on the northern boundary of the Gospel Hump, bound by Johns Creek drainage on the east, and a series of roads on the west."[26]
>
> ….
>
> From what Friends of the Clearwater knows about the unroaded area west of Johns Creek, there has been minimal management in the corridor west of Johns Creek that varies in width, though around one mile is some places. It can also be defined, in many places, on topographic lines.

Footnotes in the above quote and included below are in the original though numbered differently. The point is while the Forest Service now recognizes some roadless lands west of Johns Creek, there are errors in the map and the larger roadless expanse is not shown, which can give the wrong impression of the extent of roadless land. Indeed, the FEIS notes 5,363 acres of roadless

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[25] The Forest Service has also claimed in past documents, attached, that prescribed fire has no negative impacts on roadless characteristics. Our DEIS comments and the map we provided showing the roadless area affected (meaning proposed for logging and roadbuilding) was in in this context. It was not intended to be reflective of the greater roadless area contiguous to the Gospel Hump Wilderness. We do have a discussion of prescribed fire in roadless in this objection as we raised the issue of fire in our DEIS comments.

[26] In any case, the unroaded expanse is larger as we show in the attached map, the base taken from the DEIS page C-14. We explore this issue further in this section.

land, which is significantly less than only The attached *Maps, photos and roadless detail* folder explains what would constitute a greater roadless expanse, roadless and wilderness values of the unroaded area, and a wilderness addition to the Gospel Hump Wilderness based upon identifying topographic or surveyed lines, which is slightly smaller than the roadless area.

Lastly, the inconsistency in the way the Forest Service analyzes impacts to roadless areas, cited in our comments and included in this objection point, would affect how the Forest Service draws a roadless expanse boundary. If the Forest Service were consistent with recent claims it has made about logging and temporary roads not affecting roadless areas, then everything except major roads would be included in the roadless expanse in the project area. The fact that the FEIS does not include such an expansive roadless area proves the agency's duplicity in identifying roadless or unroaded areas and in analyzing negative impacts to these same areas.

Failure to Adequately Analyze Roadless and Wilderness Impacts

We noted in our comments:

> The NPCNF exhibits notable inconsistencies for analyzing timber sale impacts on roadless areas. In recent years, the FS's position was that logging doesn't significantly affect the potential of roadless or unroaded areas to be recommended or qualified for wilderness designation. More recently the Lolo, Insect & Disease DEIS states, "wilderness designations and mapping in the short term (approximately 20 years following harvest) of the Eldorado Creek IRA would likely be drawn to exclude the approximate 318 acres of proposed timber harvest within the IRA…" Here, the DEIS states, "The purpose of this analysis is to evaluate the environmental consequences of the proposed actions on wilderness characteristics in the unroaded area expanse that is contiguous to the northern boundary of the Gospel Hump Wilderness." Yet the DEIS proceeds to include nothing like such an analysis. The FS needs to provide a credible explanation for all its flip flopping.[27]
>
> …
>
> Given the fact that the NPCNF's consideration of "temporary" roads as something that will be decommissioned and then reconstructed in unlimited cycles, to repeatedly react to the impacts of its never-ending fire suppression, we have no reason to believe that impacts to roadless areas would be limited to only about 20 years. What is the likelihood of the FS proposing constructing roads, however "temporary," into this unroaded area in the future?
>
> The USFS Northern Region explains the concept of "Roadless Expanse" in a document cited in the DEIS, entitled "Our Approach to Roadless Area Analysis of Unroaded Lands Contiguous to Roadless Areas" (12/2/10). In summary, this paper is FS interpretation of federal case law/judicial history regarding the Roadless Area Conservation Rule. It states

[27] For example, the Fuzzy Bighorn NEPA document shows that logging in roadless areas, even at the fringe, has a definite negative impact. The Johnson Bar Project File shows impacts from past logging that eliminated consideration of one roadless area. However, the Lowell WUI Project File, the Orogrande Community and the Little Slate NEPA documents show no impact.

> that "projects on lands contiguous to roadless areas must analyze the environmental consequences, including irreversible and irretrievable commitment of resources on roadless area attributes, and the effects for potential designation as wilderness under the Wilderness Act of 1964. **This analysis must consider the effects to the entire roadless expanse; that is both the roadless area and the unroaded lands contiguous to the roadless area**." (Emphasis added.) The DEIS fails to include such an analysis.

Footnote in the above quote is in the original, and reproduced below, though numbered differently from the original. While the Forest Service obviated the need to do roadless analysis on some units that were dropped or modified to exclude roadless acreage, the fact that some roadless areas will be logged and roads built necessitates an analysis of impacts from the proposal.[28]

Before delving into the problem of inconsistent and illogical analysis of impacts to roadless areas, we first need to address the issue of the inconsistent representation of Alternative 2 in the FEIS. Appendix A (maps) pages 13 and 14 don't show logging units 42, 43 or 51 in the roadless area, but page 25 does.[29] Thus, we don't really know what is proposed in Alternative 2, the proposed action. This needs to be fixed.

The major problem is the lack of consistent analysis about roadless impacts. On one hand, small past impacts the agency alleges remove areas from consideration as documented in our earlier comments cited above and the submissions with those comments.[30] This also includes how the FEIS itself has mapped the roadless (unroaded) area boundary. For example, the narrow finger of unroaded land near Sawyer Ridge and land to the north of what the FEIS shows as unroaded along Johns Creek we showed on our map submitted with the DEIS comments.[31] At the same time, the FEIS includes land that was logged, which may not have yet recovered, though some of it may.[32]

Nonetheless, perhaps the biggest failing is that areas slated for logging, especially even-aged management, will lost their roadless and wilderness character, at least for decades. The FEIS does not recognize this except in context of past logging and development. For example:

> The western edge of the unroaded area has effects of modern civilization where management actions have occurred in the past. These activities include roads, motorized trails[33] and past timber harvests.

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[28] Burning in roadless areas is also addressed later in this objection point.

[29] Further, the vegetation treatment map for Alternative 4 does not show burning (page 25), though burning apparently is proposed.

[30] See also the attached agency documents, which demonstrate considerable inconsistencies.

[31] See the attached *Maps, photos, and roadless detail* for a complete map.

[32] Id.

[33] Trails are not roads and don't affect the roadless nature of an area, though motorized use should be prohibited in all roadless areas because of other concerns including impacts to wildlife and conflict. With those of foot or horseback. Indeed, the Forest Service approved motorized trail use on one trail on the Nez Perce - Clearwater National Forests in an area the agency recommends for Wilderness and has an alternative in the draft forest plan that would allow motorized use in recommended Wilderness. Further, the Nez Perce National Forest Travel Plan has not

> Southern and eastern areas have natural appearing landscapes with high scenic quality representing undisturbed lands with little influences from man.
>
> The northern area has some road building and past harvest units and becomes more primitive travelling east into Johns Creek.

FEIS at 247. Thus, the boundary of the area is defined by the development. However, the FEIS later alleges that the temporary roads and clearcuts "would have **minimal effect** on Natural and Undeveloped characteristics as these areas have specified roads, motorized trails, and past timber harvests currently on the landscape." FEIS at page 249, emphasis in original. This is illogical and inconsistent. The boundaries of the roadless area are defined and bounded by the development; the development is not included in the roadless area, or at least shouldn't be. Development into the roadless/unroaded area will reduce the size of the roadless area further. Under this supposed logic, there could never be an impact from destroying a large unroaded or roadless area through creeping development and the area could be incrementally developed into oblivion.

Further, there are no maps in the FEIS showing the reduction in the roadless/unroaded area from the various alternative. No acreages are given. That is a failure in the NEPA analysis.

In essence what the FEIS does is claim the area is unroaded, then claims that it really isn't unroaded and development would not harm it.

This non-analysis fails NEPA. While we do take issue with the way the roadless/unroaded boundary was drawn in the FEIS in some specific places; that is due to an inconsistent and shoddy analysis as documented in the attached materials. A better roadless boundary is included in our materials, one suggested by the map of past actions in the DEIS, but including all of the roadless area and the northeaster part of the project area not affected by logging.

Compare the description of the impacts to the unroaded area—which the Forest Service leads the reader to believe really isn't unroaded, so the impacts from further intrusions are minimal—with the descriptions to Wilderness where logging will take place nearly to the wilderness boundary. Here the Forest Service claims:

> No management actions are proposed within the Gospel Hump Wilderness, however, management actions are proposed along the northwest boundary outside of the Wilderness. Management actions include timber harvest units along with temporary road construction. These activities are split by Road 444 and 444A systems which are open yearlong to motorized uses. Due to the extensive use of Road 444 and moderate use of Road 444A, wilderness characteristics would not be affected long term. Short term effects would occur when timber activity and hauling occurs on the associated road segments, however, these would not contribute direct effects to the Gospel Hump Wilderness. Indirectly, increased noise would most likely be heard by visitors recreating along the northwest corner of the wilderness. This effect is difficult to measure due to the relative busy traffic which already occurs along Roads 444, 221 and the motorized system trails adjacent to the wilderness.

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yet been released in final form after many months. These are not motorized trails, rather trails the Forest Service has illegally allowed to be used by motorized vehicles without complying with the executive orders from the 1970s!

There will be no irreversible effects to the Gospel Hump Wilderness.

So, we are told that logging up to nearly the boundary of Wilderness has no direct impact on Wilderness, which is contrary to case law and other analyses.[34] In essence, we are told development and noise can happen up to the boundary of Wilderness with little impact and it can happen inside roadless/unroaded areas with minimal impact, though the same impacts are what preclude the identification of a larger roadless/unroaded area or would preclude wilderness designation. The only difference is, unlike the roadless area, there is no development proposed inside the Wilderness. The absurdity of this so-called analysis is astonishing and we go into more detail in the paragraphs below.

Regarding Wilderness, the FEIS fails to recognize the protection afforded to and qualities of designated Wilderness, suggesting that things outside of the boundary won't have much of an impact on the Wilderness itself. Yet, the agency also recognizes the negative impact of outside activities on Wilderness (see attached Keeping it Wild 2). It should also be recognized that the legislation establishing the Gospel Hump does not have buffer zone language, so the agency is not only obligated to analyze the impact from its actions outside of Wilderness on the wilderness, but also has the duty to protect the Wilderness, including the authority to preclude actions near the boundary that may have negative impacts. Neither the flawed analysis nor the lack of concern for the Wilderness in the FEIS meet the requirements of NEPA or the Wilderness Act.

Recent actions by the Forest Service on the boundary of the project area—logging along the Wilderness-side of the 444 route—also prove the inconsistency of the way the agency treats the Wilderness. The photo on the next page documents that action.

[34] See attached Keeping it Wild 2 and a critique of that process.

While roadless/unroaded areas do not the same statutory protection as areas designated as wilderness, the important values of those areas can also be affected by outside activities, though such activities do not render an area roaded and undeveloped. Indeed, motorized and mechanized vehicle use, though it has a negative impact on wildlife and other visitors to a roadless area, do not preclude the area from being roadless or change the physical character of a area so that it is no longer roadless.

Yet, the FEIS engages in an inconsistent and deeply flawed analysis of impacts to the roadless area that is based partly on two false premises: a) the development on the boundary (just outside) of the Roadless/unroaded area renders an undefined portion of that area no longer roadless (FEIS at 247); and b) that motorized use on trails in the area makes the area no longer roadless (Ibid).

The first false premise is highly illogical, especially given the fact the agency claims little impact to the designated Wilderness from upgrading the 444 and 444A routes, the boundary of the Gospel Hump Wilderness (offset in the official boundary), logging up to the 444A road, and recent actions along the Wilderness side of the 444 road.[35] In essence the agency is saying developments along the boundary and just outside of an area designated as wilderness has little impact, yet the same kind of development precludes an undermined amount of land in the unroaded area from being called unroaded.

The issue of trails where motorized use has not been precluded is equally flawed.[36] Indeed, the Idaho Roadless Rule does not preclude motorized use in any theme, recognizing such use does not preclude the areas from remaining a roadless areas.

The FEIS claims positive to burning on the roadless area. That has been a consistent theme with the Forest Service. The trammeling impacts of agency-ignited fire are admitted but passed over quickly. In fact, there is no real analysis of these impacts nor is there and analysis of the impacts to Wilderness, should one of these fires escape and burn into the Wilderness. This section omits the crucial issue of spring burning, which is not the time when fires were naturally

Remedies:
Redo the roadless/unroaded area analysis.
Drop the following units in whole or part: 37, 41, 48, 49, 50, 60, 61, 74, 75, 80, 81, 82, 83 and 84. (also units 42, 43, 44 and 45 if map 25 is the accurate map).
Allow natural fire to accomplish the burning in the roadless area.

FIRE POLICY AND FIRE ECOLOGY

FOC comments on the DEIS discuss fire at pp. 38-42. We incorporate those comments, and add the following.

The FEIS states the "overall purpose of the Hungry Ridge Restoration project" includes "reduce the potential risk to private property and structures" and a specific need is to "Reduce the potential risk to private property and structures." Thus, the FS is taking the position that "fuel" arrangement is the overriding threat to private property and structures. This is counter to best available scientific information. The FEIS fails to disclose that fuel moisture, weather, and topography are by far the factors with the most influence on fire behavior and spread. And our comments on the DEIS pointed out that responsibility for the risk of fire burning private structures rests squarely on the shoulders of the owners of those structures.

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[35] It would appear the road upgrading necessary for the 444 and 444A roads would exceed the level 3 standard in the Gospel-Hump Wilderness Management Plan on page 26. Regardless, there is no analysis of the impact of this road upgrading on Wilderness, especially the radical change in the character of the route to Sawyer Ridge.

[36] The Forest Service has not precluded motorized use in sensitive unroaded areas, in violation of the executive orders on off-road vehicles. The default of those orders is closed unless designated open. The Forest Service has done just the opposite.

We incorporate "A New Direction for California Wildfire Policy—Working from the Home Outward" dated February 11, 2019 from the Leonard DiCaprio Foundation. It criticizes policies from the state of California, which are essentially the same Forest Service fire policies on display in the NPCNF. From the Executive Summary: "These policies try to alter vast areas of forest in problematic ways through logging, when instead they should be focusing on helping communities safely co-exist with California's naturally fire-dependent ecosystems by prioritizing effective fire-safety actions for homes and the zone right around them. This new direction—working from the home outward—can save lives and homes, save money, and produce jobs in a strategy that is better for natural ecosystems and the climate." It also presents an eye-opening analysis of the Camp Fire, which destroyed the town of Paradise.

We also incorporate the John Muir Project document "Forest Thinning to Prevent Wildland Fire …vigorously contradicted by current Science" (Attachment 2).

We likewise incorporate "Open Letter to Decision Makers Concerning Wildfires in the West" signed by over 200 scientists (Attachment 3).

And also see "Land Use Planning More Effective Than Logging to Reduce Wildfire Risk" (Attachment 4).

The FEIS does not disclose if actions have been taken to reduce fuels on private lands adjacent to the Project area, or how those activities (or lack of) will impact the efficacy of the activities proposed for this Project.

The risks of fire are best dealt with in the immediate vicinity of homes, and by focusing on routes for egress during fire events—not by logging national forest lands well away from human occupied neighborhoods. The FEIS fails to disclose that the only effective way to prevent structure damage is to manage the fuels in the immediate vicinity of those structures.

The nine-part Wildfire Research Fact Sheet Series was produced by the National Fire Protection Association (NFPA)'s Firewise USA® program, as part of the NFPA/USDA Forest Service cooperative agreement and with research provided by the Insurance Institute for Business and Home Safety (IBHS). They are a product of the research done by the IBHS lab in South Carolina, covering a wide range of issues. This Firewise approach also begs the question—why isn't the NPCNF implementing an aggressive outreach and education program to assist homeowners living in and near the project area and elsewhere in the Wildland-Urban Interface (WUI)?

In support of focusing on manipulating limited areas near homes, Finney and Cohen, 2003, state:

> Research findings indicate that a home's characteristics and the characteristics of a home's immediate surroundings within 30 meters principally determine the potential for wildland-urban fire destruction. This area, which includes the home and its immediate surroundings, is termed the home ignition zone. The home ignition zone implies that activities to reduce the potential for wildland-urban fire destruction can address the necessary factors that determine ignitions and can be done sufficiently to reduce the likelihood of ignition. Wildland fuel reduction outside and adjacent to a home ignition zone might reduce the potential flame and firebrand exposure to the home ignition zone (i.e., within 30 m of the

> home). However, the factors contributing to home ignition within this zone have not been mitigated. Given a wildfire, wildland fuel management alone (i.e., outside the home ignition zone) is not sufficient nor does it substitute for mitigations within the home ignition zone. ...(I)t is questionable whether wildland fuel reduction activities are necessary and sufficient for mitigating structure loss in wildland urban fires.
>
> …(W)ildland fuel management changes the … probability of a fire reaching a given location. It also changes the distribution of fire behaviors and ecological effects experienced at each location because of the way fuel treatments alter local and spatial fire behaviors (Finney 2001). **The probability that a structure burns, however, has been shown to depend exclusively on the properties of the structure and its immediate surroundings (Cohen 2000a).** (Emphasis added.)

Our take from Finney and Cohen (2003) is that there is much uncertainty over effects of fuel reduction. The authors point out:

> Although the conceptual basis of fuel management is well supported by ecological and fire behavior research in some vegetation types, the promise of fuel management has lately become loaded with the expectation of a diffuse array of benefits. Presumed benefits range from restoring forest structure and function, bringing fire behavior closer to ecological precedents, reducing suppression costs and acres burned, and preventing losses of ecological and urban values. For any of these benefits to be realized from fuel management, a supporting analysis must be developed to physically relate cause and effect, essentially evaluating how the benefit is physically derived from the management action (i.e. fuel management). Without such an analysis, the results of fuel management can fail to yield the expected return, potentially leading to recriminations and abandonment of a legitimate and generally useful approach to wildland fire management.

In response to comments the FS quotes Finney and Cohen, 2003, saying wildland fuel management treatment areas "should extend perhaps many kilometers away from urban locations because treatments here are critical to reducing the likelihood that wildland fire will spread ...and pose ignition threats" within the home ignition zone." We fully expect researchers employed by the Forest Service to reflect the same management bias as the writers of this FEIS. The latter, however are distinguished from Finney and Cohen, 2003 who recognize: "To reduce expected loss from home ignition, it is necessary and **often sufficient to manage fuels only within the home ignition zone** …**and abide by fire resistant home construction standards**…" (Emphasis added).

FOC comments included:

> "Approximately 80% of the planning area is recognized as Wildland-Urban interface (WUI)." This is apparently because "Two private properties …are at risk from wildfires." This illustrates the illegitimacy of the WUI concept for the project area, which has never been evaluated within any NEPA context.

The FS did not respond.

The FEIS emphasizes actions that attempt to adapt a fire-prone ecosystem to the presence of human development, however we firmly believe the emphasis must be the opposite—assisting human communities to adapt to the fire-prone ecosystems into which they been built.

We strongly support government actions which facilitate cultural change towards private landowners taking the primary responsibility for mitigating the safety and property risks from fire, by implementing firewise activities on their property. Indeed, the best available science supports such a prioritization. (Kulakowski, 2013; Cohen, 1999a) Also, see Firewise Landscaping[37] as recommended by Utah State University, and the Firewise USA website by the National Fire Protection Association[38] for examples of educational materials.

The FEIS fails to disclose the actions being taken to reduce fuels on private lands adjacent to the Project area, and how those activities (or lack of) will impact the efficacy of the activities proposed for this Project.

In response to comments, the FS provided the definition, "Catastrophic wildfire can be defined as a fire with high severity fire effects. Generally, the severity of a fire is based on the loss of organic matter within the fire. This can be measured by crown scorch volume, litter and duff layers, and ash characteristics." We note that none of this suggests such fires are in any way out of the ordinary for this fire-prone ecosystem in which the project area is located.

A recent article in Phys.org reports on results of a study by DellaSala and Hanson, 2019:

> They found no significant trend in the size of large high-severity burn patches between 1984 and 2015, disputing the prevailing belief that increasing megafires are setting back post-fire forest regeneration. "This is the most extensive study ever conducted on the high-severity fire component of large fires, and our results demonstrate that there is no need for massive forest thinning and salvage logging before or after a forest fire," says Dr. Dominick A. DellaSala, lead author of the study and Chief Scientist at the Geos Institute. "The perceived megafire problem is being overblown. After a fire, conditions are ideal for forest re-establishment, even in the interior of the largest severely burned patches. We found conditions for forest growth in interior patches were possible over 1000 feet from the nearest low/moderately burned patch where seed sources are most likely."

DellaSala, et al. (1995) state:

> Scientific evidence does not support the hypothesis that intensive salvage, thinning, and other logging activities reduce the risk of catastrophic fires if applied at landscape scales ... At very local scales, the removal of fuels through salvage and thinning may hinder some fires. However, applying such measures at landscape scales removes natural fire breaks such as moist pockets of late-seral and riparian forests that dampen the spread and intensity of fire and has little effect on controlling fire spread, particularly during regional droughts.

[37] https://extension.usu.edu/ueden/ou-files/Firewise-Landscaping-for-Utah.pdf
[38] http://www.nfpa.org/Public-Education/By-topic/Wildfire/Firewise-USA/The-ember-threat-and-the-home-ignition-zone

> ... Bessie and Johnson (1995) found that surface fire intensity and crown fire initiation were strongly related to weather conditions and only weakly related to fuel loads in subalpine forest in the southern Canadian Rockies. . . . Observations of large forest fires during regional droughts such as the Yellowstone fires in 1988 (Turner, et al. 1994) and the inland northwest fires of 1994 . . . raise serious doubts about the effectiveness of intensive fuel reductions as "fire-proofing" measures.

Veblen (2003) states:

> The premise behind many projects aimed at wildfire hazard reduction and ecological restoration in forests of the western United States is the idea that unnatural fuel buildup has resulted from suppression of formerly frequent fires. This premise and its implications need to be critically evaluated by conducting area-specific research in the forest ecosystems targeted for fuels or ecological restoration projects. Fire regime researchers need to acknowledge the limitations of fire history methodology and avoid over-reliance on summary fire statistics such as mean fire interval and rotation period. While fire regime research is vitally important for informing decisions in the areas of wildfire hazard mitigation and ecological restoration, there is much need for improving the way researchers communicate their results to managers and the way managers use this information.

Riggers, et al. 2001 state:

> (T)he real risk to fisheries is not the direct effects of fire itself, but rather the existing condition of our watersheds, fish communities, and stream networks, and the impacts we impart as a result of fighting fires. Therefore, attempting to reduce fire risk as a way to reduce risks to native fish populations is really subverting the issue. If we are sincere about wanting to reduce risks to fisheries associated with future fires, we ought to be removing barriers, reducing road densities, reducing exotic fish populations, and re-assessing how we fight fires. At the same time, we should recognize the vital role that fires play in stream systems, and attempt to get to a point where we can let fire play a more natural role in these ecosystems.

Those FS biologists emphasize, "the importance of wildfire, including large-scale, intense wildfire, in creating and maintaining stream systems and stream habitat. ...(I)n most cases, proposed projects that involve large-scale thinning, construction of large fuel breaks, or salvage logging as tools to reduce fuel loading with the intent of reducing negative effects to watersheds and the aquatic system are largely unsubstantiated."

Kauffman (2004) suggests that current FS fire suppression policies are what is catastrophic, and that fires are beneficial:

> Large wild fires occurring in forests, grasslands and chaparral in the last few years have aroused much public concern. Many have described these events as "catastrophes" that must be prevented through aggressive increases in forest thinning. **Yet the real catastrophes are not the fires themselves but those land uses, in concert with fire suppression policies that have resulted in dramatic alterations to ecosystem structure and composition**. The first step in the restoration of biological diversity (forest health) of western landscapes must be to implement changes in those factors that

> have resulted in the current state of wildland ecosystems. Restoration entails much more than simple structural modifications achieved through mechanical means. **Restoration should be undertaken at landscape scales and must allow for the occurrence of dominant ecosystem processes, such as the natural fire regimes achieved through natural and/or prescribed fires at appropriate temporal and spatial scales.** (Emphases added.)

Noss et al. (2006) state:

> Forest landscapes that have been affected by a major natural disturbance, such as a severe wildfire or wind storm, are commonly viewed as devastated. Such perspectives are usually far from ecological reality. Overall species diversity, measured as number of species–at least of higher plants and vertebrates – is often highest following a natural stand replacement disturbance and before redevelopment of closed-canopy forest (Lindenmayer and Franklin 2002). Important reasons for this include an abundance of biological legacies, such as living organisms and dead tree structures, the migration and establishment of additional organisms adapted to the disturbed, early-successional environment, availability of nutrients, and temporary release of other plants from dominance by trees. Currently, early-successional forests (naturally disturbed areas with a full array of legacies, i.e. not subject to post-fire logging) and forests experiencing natural regeneration (i.e. not seeded or planted), are among the most scarce habitat conditions in many regions.

Even if there is scientific legitimacy to the claims that fuel reductions reduce ecological damage from subsequent fire—a claim that is scientifically controversial and unproven for the long term, and unquantified for any defined short term—the area affected by such projects in recent years is miniscule compared to the entire, allegedly fire-suppressed Forest.

It may be that fire suppression in the project area has not, in reality, caused a significantly elevated risk of abnormal fire in the project area. We believe the agency is playing this fire-scare card largely to justify logging as “restoration.” However, playing the fire scare card is not just a project area issue—it's forestwide. The agency puts the joker in the deck, changing the whole game—not just for one hand as the FS pretends.

Scientific information concerning fire suppression was a major theme of the Interior Columbia Basin Ecosystem Management Project (ICBEMP) in the 1990s: “Aggressive fire suppression policies of Federal land-managing agencies have been increasingly criticized as more has been learned about natural fire cycles.” (USDA FS & USDI BLM 1996, p. 22.)

Also, “Substantial changes in disturbance regimes—especially changes resulting from fire suppression, timber management practices, and livestock grazing over the past 100 years—have resulted in moderate to high departure of vegetation composition and structure and landscape mosaic patterns from historical ranges.” (USDA FS & USDI BLM 2000, Ch. 4. P. 18.)
The effects of fire suppression are not unique to this project area—similar language has been included in NEPA documents for all logging projects on this Forest for at least a decade. If fire suppression effects as described in the FEIS are occurring, it means that, as forestwide fire suppression continues, the results of this management include continuing **increases in these**

adverse effects across the entire forest. So multiply the above list of effects times the extent of the entire forest, and what the agency tacitly admits is, forestwide fire suppression is leading to stand-replacing fires outside what is natural, and that alternation of fire regimes results in wide-scale disruption of habitats for wildlife, rare plants, tree insect and disease patterns and increases the occurrence of noxious weeds. Such analyses and disclosures are not found in the Forest Plan FEIS.

The no-action alternative contemplated under the ICBEMP EIS is the management direction found in the Forest Plan: "Alternative S1 (no action) continues management specified under each existing Forest Service and BLM land use plan, as amended or modified by interim direction—known as Eastside Screens (national forests in eastern Oregon and Washington only), PACFISH, and INFISH—as the long-term strategy for lands managed by the Forest Service or BLM." (USDA FS & USDI BLM 2000. Ch. 5, pp 5-6.)

The philosophy driving the FS strategy to replicate historic vegetative conditions (i.e. desired conditions) is that emulation of the results of disturbance processes would conserve biological diversity. McRae et al. 2001 provide a scientific review summarizing empirical evidence that illustrates several significant differences between logging and wildfire—differences which the FEIS fails to address. Also, Naficy et al. 2010 found a significant distinction between fire-excluded ponderosa pine forests of the northern Rocky Mountains logged prior to 1960 and paired fire-excluded, unlogged counterparts:

> We document that fire-excluded ponderosa pine forests of the northern Rocky Mountains logged prior to 1960 have much higher average stand density, greater homogeneity of stand structure, more standing dead trees and increased abundance of fire-intolerant trees than paired fire-excluded, unlogged counterparts. Notably, the magnitude of the interactive effect of fire exclusion and historical logging substantially exceeds the effects of fire exclusion alone. These differences suggest that historically logged sites are more prone to severe wildfires and insect outbreaks than unlogged, fire-excluded forests and should be considered a high priority for fuels reduction treatments. Furthermore, we propose that ponderosa pine forests with these distinct management histories likely require distinct restoration approaches. We also highlight potential long-term risks of mechanical stand manipulation in unlogged forests and emphasize the need for a long-term view of fuels management.

Bradley et al. 2016 studied the fundamental premise that mechanical fuel reduction will reduce fire risk. This study "found forests with higher levels of protection had lower severity values even though they are generally identified as having the highest overall levels of biomass and fuel loading." In fact, the study's results suggest the opposite: "(B)urn severity tended to be higher in areas with lower levels of protection status (more intense management), after accounting for topographic and climatic conditions in all three model runs. Thus, we rejected the prevailing forest management view that areas with higher protection levels burn most severely during wildfires." The study goes on to discuss other findings:

> An extension of the prevailing forest/fire management hypothesis is that biomass and fuels increase with increasing time after fire (due to suppression), leading to such intense fires that the most long-unburned forests will experience predominantly severe fire behavior (e.g., see USDA Forest Service 2004, Agee

> and Skinner 2005, Spies et al. 2006, Miller et al. 2009b, Miller and Safford 2012, Stephens et al. 2013, Lydersen et al. 2014, Dennison et al. 2014, Hessburg 2016). However, this was not the case for the most long-unburned forests in two ecoregions in which this question has been previously investigated—the Sierra Nevada of California and the Klamath-Siskiyou of northern California and southwest Oregon. In these ecoregions, the most long-unburned forests experienced mostly low/moderate-severity fire (Odion et al. 2004, Odion and Hanson 2006, Miller et al. 2012, van Wagtendonk et al. 2012). Some of these researchers have hypothesized that as forests mature, the overstory canopy results in cooling shade that allows surface fuels to stay moister longer into fire season (Odion and Hanson 2006, 2008). This effect may also lead to a reduction in pyrogenic native shrubs and other understory vegetation that can carry fire, due to insufficient sunlight reaching the understory (Odion et al. 2004, 2010).

From a news release announcing the results of the Bradley et al. 2016 study:

> "We were surprised to see how significant the differences were between protected areas managed for biodiversity and unprotected areas, which our data show burned more severely," said lead author Curtis Bradley, with the Center for Biological Diversity.
>
> The study focused on forests with relatively frequent fire regimes, ponderosa pine and mixed-conifer forest types; used multiple statistical models; and accounted for effects of climate, topography and regional differences to ensure the findings were robust.

"The belief that restrictions on logging have increased fire severity did not bear out in the study," said Dr. Chad Hanson, an ecologist with the John Muir Project. "In fact, the findings suggest the opposite. The most intense fires are occurring on private forest lands, while lands with little to no logging experience fires with relatively lower intensity."

"Our findings demonstrate that increased logging may actually increase fire severity," said Dr. Dominick A. DellaSala, chief scientist of Geos Institute. "Instead, decision-makers concerned about fire should target proven fire-risk reduction measures nearest homes and keep firefighters out of harm's way by focusing fire suppression actions near towns, not in the back country."

Zald and Dunne, 2018 state, "intensive plantation forestry characterized by young forests and spatially homogenized fuels, rather than pre-fire biomass, were significant drivers of wildfire severity."

Wales, et al. 2007 modeled various potential outcomes of fire and fuel management scenarios on the structure of forested habitats in northeast Oregon. They projected that the **natural disturbance scenario resulted in the highest amounts of all types of medium and large tree forests combined** and best emulated the Natural Range of Variability for medium and large tree forests by potential vegetation type after several decades. Restoring the natural disturbances regimes and processes is the key to restoring forest structure and functionality similar to historical conditions.

In his testimony before Congress, DellaSala, 2017 discusses "…how proposals that call for increased logging and decreased environmental review in response to wildfires and insect outbreaks are not science driven, in many cases may make problems worse, and will not stem rising wildfire suppression costs" and "what we know about forest fires and beetle outbreaks in relation to climate change, limitations of thinning and other forms of logging in relation to wildfire and insect management" and makes "recommendations for moving forward based on best available science."

Typically, attempts to control or resist the natural process of fire have been a contributor to deviations from historic conditions. The FEIS analyses skew toward considering fire as well as native insects and other natural pathogens as threats to the ecosystem rather than rejuvenating natural processes. It seems to need the obsolete viewpoint in order to justify and prioritize the proposed vegetation manipulations, tacitly for replacing natural processes with "treatments" and "prescriptions." However the scientific support for assuming that ecosystems can be restored or continuously maintained by such manipulative actions is entirely lacking.

Karr (1991) cites a definition of ecological integrity as "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 natural habitat of the region." Karr (1991) also cites a definition of ecological health: "a biological system ... can be considered healthy when its inherent potential is realized, its condition is stable, its capacity for self-repair when perturbed is preserved, and **minimal external support for management is needed**." (Emphasis added.) The FS misses that last aspect of ecological health—specifically that it doesn't need management meddling.

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."

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."

The FS's foreseeable budget for the NPCNF would not allow enough vegetation management under the agency's paradigm to "fix" the problems the FS says would be perpetuated by fire suppression. The FS did not conduct any analysis that faces up to any **likely** budget scenario, in regards to the overall management emphases. The implication is clear: logging and fire suppression is intended to continually dominate, except in those weather situations when and where suppression actions are ineffective, in which case fires of high severity will occur across relatively wide areas. No cumulative effects analysis at any landscape scale exists to disclose the environmental impacts.

Also in claiming landscape departures from historic conditions, the FEIS does not provide a spatial analysis, either for the true reference conditions or of current project area conditions. The FEIS has no scientifically defensible analysis of the project area **landscape pattern** departure from HRV.

Churchill, 2011 points out:

> Over time, stand development processes and biophysical variation, along with low and mixed-severity disturbances, **break up these large patches into a finer quilt of patch types. These new patterns then constrain future fires**. Landscape pattern is thus generated from a blend of finer scale, feedback loops of vegetation and disturbance and broad scale events that are driven by extreme climatic events.

(Emphases added.) Churchill describes above the ongoing natural processes that will alleviate problems alleged in the FEIS—without expensive and ecologically risky logging and road building. Since no proper spatial analysis of the landscape pattern's departure has been completed, the FEIS has no scientifically defensible logging solution.

The FS assumes that natural fire regimes would maintain practically all the low and mid-elevation forests in open conditions with widely spaced mature and old trees. The FS fails to acknowledge that mixed-severity and even low-severity fire regimes result in much more variable stand conditions across the landscape through time. Assumptions that drier forests did not experience stand-replacing fires, that fire regimes were frequent and nonlethal, that these stands were open and dominated by large well-spaced trees, and that fuel amounts determine fire severity (the false thinning hypothesis that fails to recognize climate as the overwhelming main driver of fire intensity) are not supported by science (see for example Baker and Williams 2015, Williams and Baker 2014, Baker et al. 2006, Pierce et al. 2004, Baker and Ehle 2001, Sherriff et al. 2014). Even research that has uncritically accepted the questionable ponderosa pine model that may only apply to the Mogollon Rim of Arizona and New Mexico (and perhaps in similar dry-forest types in California), notes the inappropriateness of applying that model to elsewhere (see Schoennagel et al. 2004). The FEIS's assertion that the proposed treatments will result in likely or predictable later wildland fire effects is of considerable scientific doubt (Rhodes and Baker, 2008).

Despite the fact that the FEIS makes many statements to the effect that without the proposed treatments there is a high likelihood of highly adverse effects on various resources due to wildfire, it discloses nothing about such effects from recent fires in the general area. The FS's fear-invoking statements about the impacts of fire are speculative and not based upon data or any empirical evidence, in violation of NEPA.

Large fires are weather-driven events, not fuels-driven. When the conditions exist for a major fire—which includes drought, high temperatures, low humidity and high winds—nothing, including past logging, halts blazes. Such fires typically self-extinguish or are stopped only when less favorable conditions occur for fire spread. As noted in Graham, 2003:

> The prescriptions and techniques appropriate for accomplishing a treatment require understanding the fuel changes that result from different techniques and the fire behavior responses to fuel structure**. Fuel treatments, like all vegetation changes, have temporary effects and require repeated measures, such as prescribed burning, to maintain desired fuel structure.**

If the predictions of uncharacteristically severe fire were accurate, one might think that the results of scientific validation of such assumptions would have been conducted in the NPCNF by now, and cited in the FEIS. We find no data or scientific analysis of those fires' effects validating the FEIS's predictions of uncharacteristically severe fire effects if the logging is not conducted.

The FEIS fails to explain the fire implications of no treatment applied to most of the project area under the action alternatives.

The FEIS did not provide a genuine analysis and disclosure of the varying amounts and levels of effectiveness of fuel changes attributable to: the varying ages of the past cuts, the varying forest types, the varying slash treatments, etc.

There has been extensive research in forests about the ecological benefits of mixed-severity (which includes high-severity) fire over the past two decades, so much so that in 2015 science and academic publishers Elsevier published a 400-page book, *The Ecological Importance of Mixed-Severity Fires: Nature's Phoenix* which synthesizes published, peer-reviewed science investigating the value of mixed- and high-severity fires for biodiversity (DellaSala and Hanson, 2015). The book includes research documenting the benefits of high-intensity wildfire patches for wildlife species, as well as a discussion of mechanical "thinning" and its inability to reduce the chances of a fire burning in a given area, or alter the intensity of a fire, should one begin under high fire weather conditions, because overwhelmingly weather, not vegetation, drives fire behavior (DellaSala and Hanson, 2015, Ch. 13, pp. 382-384).

Baker, 2015, states: "Programs to generally reduce fire severity in dry forests are not supported and have significant adverse ecological impacts, including reducing habitat for native species dependent on early-successional burned patches and decreasing landscape heterogeneity that confers resilience to climatic change."

Baker, 2015 concluded: "Dry forests were historically renewed, and will continue to be renewed, by sudden, dramatic, high-intensity fires after centuries of stability and lower-intensity fires."

Baker, 2015 writes: "**Management issues…** The evidence presented here shows that efforts to generally lower fire severity in dry forests for ecological restoration are not supported."

In his book, "Fire Ecology in Rocky Mountain Landscapes" William Baker writes on page 435, "…a prescribed fire regime that is too frequent can reduce species diversity (Laughlin and Grace 2006) and favor invasive species (M.A. Moritz and Odion 2004). Fire that is entirely low severity in ecosystems that historically experience some high-severity fire may not favor germination of fire-dependent species (M.A. Moritiz and Odion 2004) or provide habitat key animals (Smucker, Hutto, and Steele 2005)." And on page 436: "Fire rotations equal the average mean fire interval across a landscape and are appropriate intervals at which individual points or the whole landscape is burned. Composite fire intervals underestimate mean fire interval and fire rotation (chap 5) and should not be used as prescribed burning intervals as this would lead to too much fire and would likely lead to adversely affect biological diversity (Laughlin and Grace 2006)."

Baker estimates the high severity fire rotation to be 135 - 280 years for lodgepole pine forests. (See page 162.). And on pp. 457-458: "Fire rotation has been estimated as about 275 years in the Rockies as a whole since 1980 and about 247 years in the northern Rockies over the last century, and both figures are near the middle between the low (140 years) and high (328 years) estimates for fire rotation for the Rockies under the HRV (chap. 10). These estimates suggest that since EuroAmerican settlement, fire control and other activities may have reduced fire somewhat in particular places, but a general syndrome of fire exclusion is lacking. Fire exclusion also does not accurately characterize the effects of land users on fire or match the pattern of change in area burned at the state level over the last century (fig. 10.9). In contrast, fluctuation in drought linked to atmospheric conditions appear to match many state-level patterns in burned area over the last century. Land uses that also match fluctuations include logging, livestock grazing, roads and development, which have generally increased flammability and ignition at a time when the climate is warming and more fire is coming."

Schoennagel et al., 2004 state: "High-elevation subalpine forests in the Rocky Mountains typify ecosystems that experience infrequent, high-severity crown fires []. . . The most extensive subalpine forest types are composed of Engelmann spruce (Picea engelmannii), subalpine fir (Abies lasiocarpa), and lodgepole pine (Pinus contorta), all thin-barked trees easily killed by fire. Extensive stand-replacing fires occurred historically at long intervals (i.e., one to many centuries) in subalpine forests, typically in association with infrequent high-pressure blocking systems that promote extremely dry regional climate patterns."

Schoennagel et al., 2004 state:

> (I)t is unlikely that the short period of fire exclusion has significantly altered the long fire intervals in subalpine forests. Furthermore, large, intense fires burning under dry conditions are very difficult, if not impossible, to suppress, and such fires account for the majority of area burned in subalpine forests.
>
> Moreover, there is no consistent relationship between time elapsed since the last fire and fuel abundance in subalpine forests, further undermining the idea that years of fire suppression have caused unnatural fuel buildup in this forest zone.
>
> No evidence suggests that spruce–fir or lodgepole pine forests have experienced substantial shifts in stand structure over recent decades as a result of fire suppression. Overall, variation in cli-mate rather than in fuels appears to exert the largest influence on the size, timing, and se-verity of fires in subalpine forests []. We conclude that large, infrequent stand replacing fires are 'business as usual' in this forest type, not an artifact of fire suppression.
>
> Contrary to popular opinion, previous fire suppression, which was consistently effective from about 1950 through 1972, had only a minimal effect on the large fire event in 1988 []. Reconstruction of historical fires indicates that similar large, high-severity fires also occurred in the early 1700s []. Given the historical range of variability of fire regimes in high- elevation subalpine forests, fire behavior in Yellowstone during 1988, although severe, was neither unusual nor surprising.

> Mechanical fuel reduction in subalpine forests would not represent a restoration treatment but rather a departure from the natural range of variability in stand structure.
>
> Given the behavior of fire in Yellowstone in 1988, fuel reduction projects probably will not substantially reduce the frequency, size, or severity of wildfires under extreme weather conditions.
>
> The Yellowstone fires in 1988 revealed that variation in fuel conditions, as measured by stand age and density, had only minimal influence on fire behavior. Therefore, we expect fuel- reduction treatments in high-elevation forests to be generally unsuccessful in reducing fire frequency, severity, and size, given the overriding importance of extreme climate in controlling fire regimes in this zone. Thinning also will not re-store subalpine forests, because they were dense historically and have not changed significantly in response to fire suppression. Thus, fuel-reduction efforts in most Rocky Mountain subalpine forests probably would not effectively mitigate the fire hazard, and these efforts may create new ecological problems by moving the forest structure out-side the historic range of variability.

Whereas the FEIS claims to be reducing risk of wildfire by reducing forest canopy density, the proposed action will result in increased fire severity and more rapid fire spread. This common sense is recognized in a news media discussion of the 2017 Eagle Creek fire in Oregon:

> **Old growth not so easy to burn:**
>
> Officials said the fire spread so rapidly on the third and fourth days because it was traveling across lower elevations.
>
> The forests there aren't as thick and as dense as the older growth the fire's edge is encountering now - much of it in the Mark O. Hatfield Wilderness, Whittington said.
>
> Whittington said because **there's more cover from the tree canopy, the ground is moister -- and that's caused the fire to slow. Also, bigger trees don't catch fire as easily**, he said.

(Emphasis added.) Green 2017. The FS also likes to trot out the premise that tree mortality from native insect activity and other agents of tree mortality increase risk of wildfire. Again, this is not supported by science. Meigs, et al., 2016 found "that insects generally reduce the severity of subsequent wildfires. … By dampening subsequent burn severity, native insects could buffer rather than exacerbate fire regime changes expected due to land use and climate change. In light of these findings, we recommend a precautionary approach when designing and implementing forest management policies intended to reduce wildfire hazard and increase resilience to global change."

Also *see* Black, S.H. 2005 (Logging to Control Insects: The Science and Myths Behind Managing Forest Insect "Pests." A Synthesis of Independently Reviewed Research) and Black, et al., 2010 (Insects and Roadless Forests: A Scientific Review of Causes, Consequences and

Management Alternatives) as well as DellaSala (undated), Kulakowski (2013), Hanson et al., 2010, and Hart et al., 2015. And for an ecological perspective from the FS itself, see Rhoades et al., 2012, who state: "While much remains to be learned about the current outbreak of mountain pine beetles, researchers are already finding that **beetles may impart a characteristic critically lacking in many pine forests today: structural complexity and species diversity**." (Emphasis added.)

McClelland (undated) criticizes the aim to achieve desired conditions by the use of mitigation measures calling for retention of specific numbers of certain habitat structures:

> 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.).

Collins and Stephens (2007) understand that <u>*educating the public*</u> is a prerequisite for restoring the process of wildland fire. This means explaining and embracing the inevitability of wildland fire and teaching about fire ecology. Also, there is a proliferation of information on the worldwide web for property owners, who have the primary responsibility for protecting their homes. See this video by the National Fire Protection Association, for example.

We incorporate into this objection the John Muir Project's document, "Do beetle outbreaks in western forests increase fire severity?" (Attachment 5).

Hutto, 1995 states: "Fires are clearly beneficial to numerous bird species, and **are apparently necessary for some**."

See Attachment 6, which is a collection of news media articles, quoting experts including those in the FS, who do understand the high value of severely burned forest for wildlife and other resources.

The FEIS fails to disclose or acknowledge the scientific information that indicates severe fires burning over large acreages are normal for these forests, and that fire intensity and severity are dependent much more upon weather than fuels. It's common knowledge by now. If the purpose for a project is built upon false information about ecological functioning, then the predicted effects of the project are not credible. This FEIS does not comply with NEPA's requirements for scientific integrity.

Huff, et al, 1995 state:

> In general, rate of spread and flame length were positively correlated with the proportion of area logged (hereafter, area logged) for the sample watersheds. …The potential rate of spread and intensity of fires associated with recently cut logging residues is high, especially the first year or two as the material decays. High fire-behavior hazards associated with the residues can extend, however, for many years depending on the tree.

> Logged areas generally showed a strong association with increased rate of spread and flame length, thereby suggesting that tree harvesting could affect the potential fire behavior within landscapes. In general, rate of spread and flame length were positively correlated with the proportion of area logged in the sample watersheds.
>
> As a by-product of clearcutting, thinning, and other tree-removal activities, activity fuels create both short- and long-term fire hazards to ecosystems. The potential rate of spread and intensity of fires associated with recently cut logging residues is high, especially the first year or two as the material decays. High fire-behavior hazards associated with the residues can extend, however, for many years depending on the tree. Even though these hazards diminish, their influence on fire behavior can linger for up to 30 years in the dry forest ecosystems of eastern Washington and Oregon.

We incorporate DellaSala, et al., 2018 which is a synopsis of current literature summarizing some of the latest science around top-line wildfire issues, including areas of scientific agreement, disagreement, and ways to coexist with wildfire.

As far as the "restoration" being alleged to address the impacts of long-term fire suppression, there is no coherent plan for integrating wildland fire back into this ecosystem. In fact in several places the FEIS indicates nothing is being changed to learn from the admitted suppression ecological damage. For example, FOC comments noted "The DEIS does not disclose how the FS will integrate wildland fire use in the project area." The FS response is: "The Nez Perce Forest Plan addresses the issue of wildland fire use and how it would be integrated within the project area. Nez Perce Forest Plan direction for the majority of the project area is managed under strategies that include **control, contain, and confine suppression actions, not fire use**. … According to fire history records **no fire management decisions pertaining to wildland fire use have been implemented within the project area within the last fifty years**." (Emphases added.) Also, "The proposed treatments will provide greater strategic and tactical suppression opportunities, and create a safer environment during suppression operations for out firefighting resources."

The war against wildland fire, i.e., nature, is ongoing.

The proposed and ongoing management are all about continuing a repressive and suppressive regime, however the FS has never conducted an adequate cumulative effects analysis of forestwide fire suppression despite the vast body of science that has arisen since the Forest Plan was adopted. The "plan" is clearly to log now, suppress fires continuously, and log again in the future based on the very same "need" to address the ongoing results of fire suppression. FOC comments stated, "the FS has never conducted an adequate cumulative effects analysis of its forestwide fire suppression despite the vast body of science that has arisen since the Plan ROD was signed in 1987." The FS failed to respond.

Odion and DellaSala, 2011 describe this situation: "…fire suppression continues unabated, creating a self-reinforcing relationship with fuel treatments which are done in the name of fire suppression. Self-reinforcing relationships create runaway processes and federal funding to stop wildfires now amounts to billions of tax dollars each year."

The FS has never conducted consultation with the USFWS on its forestwide fire management plan, which has clear ramifications for species listed under the Endangered Species Act.

Tingley et al., 2016 note the diversity of habitats following a fire is related to the diversity of burn severities: "(W)ithin the decade following fire, different burn severities represent unique habitats whose bird communities show differentiation over time… Snags are also critical resources for many bird species after fire. Increasing densities of many bird species after fire—primarily wood excavators, aerial insectivores, and secondary cavity nesters—can be directly tied to snag densities…"

Similarly, Hutto and Patterson, 2016 state, "the variety of burned-forest conditions required by fire-dependent bird species cannot be created through the application of relatively uniform low-severity prescribed fires, through land management practices that serve to reduce fire severity or through post-fire salvage logging, which removes the dead trees required by most disturbance-dependent bird species."

Hutto et al., 2016 urge "a more ecologically informed view of severe forest fires":

> Public land managers face significant challenges balancing the threats posed by severe fire with legal mandates to conserve wildlife habitat for plant and animal species that are positively associated with recently burned forests. Nevertheless, land managers who wish to maintain biodiversity must find a way to embrace a fire-use plan that allows for the presence of all fire severities in places where a historical mixed-severity fire regime creates conditions needed by native species while protecting homes and lives at the same time. This balancing act can be best performed by managing fire along a continuum that spans from aggressive prevention and suppression near designated human settlement areas to active "ecological fire management" (Ingalsbee 2015) in places farther removed from such areas. This could not only save considerable dollars in fire-fighting by restricting such activity to near settlements (Ingalsbee and Raja 2015), but it would serve to retain (in the absence of salvage logging, of course) the ecologically important disturbance process over most of our public land while at the same time reducing the potential for firefighter fatalities (Moritz et al. 2014). Severe fire is not ecologically appropriate everywhere, of course, but the potential ecological costs associated with prefire fuels reduction, fire suppression, and postfire harvest activity in forests born of mixed-severity fire need to considered much more seriously if we want to maintain those species and processes that occur only where dense, mature forests are periodically allowed to burn severely, as they have for millennia.

Ultimately the FEIS reflects an overriding bias favoring vegetation manipulation and resource extraction via "management" needed to "move toward" some selected desired conditions, along the way neglecting the ecological processes driving these ecosystems. Essentially the FS rigs the game, as its desired conditions would only be achievable by resource extractive activities. But since desired conditions must be maintained through repeated management/manipulation the management paradigm conflicts with natural processes—the real drivers of the ecosystem.

Fire, insects & disease are endemic to western forests and are natural processes resulting in the forest self-thinning. This provides for greater diversity of plant and animal habitat than logging can achieve. In areas that have been historically and logged there are less diversity of native plants, more invasive species, and less animal diversity. Six et al., 2014 documented that logging to prevent or contain insect and disease has not been empirically proven to work, and because of lack of monitoring the FS can't content this method is viable for containing insect outbreaks.

See David Erickson's news article "Experts: more logging and thinning to battle wildfires might just burnt taxpayer dollars". It cites testimony to Congress from scientist Tania Schoennagel (Schoennagel, 2017.)

We likewise incorporate "Open Letter to Decision Makers Concerning Wildfires in the West" signed by over 200 scientists.

The FEIS fails to present an analysis of the cumulative effects of livestock grazing on fire regimes. USDA Forest Service 2012c states:

> Fire regime condition class ... is used to describe the degree of departure from the historic fire regimes that results from alterations of key ecosystem components such as composition, structural stage, stand age, and canopy closure. One or more of the following activities may have caused this departure: fire exclusion, timber harvesting, **grazing**, introduction and establishment of nonnative plant species, insects or disease (introduced or native), or other past management activities. (Id., emphasis added.)

The FEIS primarily discusses fuel conditions only in the areas proposed for treatment, yet wildland fire operates beyond artificial ownership or other boundaries. In regards to the proper cumulative effects analysis area for fire risk, Finney and Cohen (2003) discuss the concept of a "fireshed involving a wide area around the community (for many miles that include areas that fires can come from)." In other words, for any given entity that would apparently have its risk of fire reduced by the proposed project (or affected cumulatively from past, ongoing, or foreseeable actions on land of all ownerships within this "fireshed")—just how effective would fuel reduction be? The FEIS fails to include a thorough discussion and detailed disclosure of the current fuel situation within the fireshed within and outside the proposed treatment units, making it impossible to make scientifically supportable and reasonable conclusions about the manner and degree to which fire behavior would be changed by the project.

The FEIS also fails to deal with the fuels issue on the appropriate temporal scale. How landscape-level fire behavior at any period except for very shortly after treatment would be changed or improved is ignored. In response to comments the FS states, "Over time the effectiveness of treatments is reduced however, the exact timeframe is difficult to predict due to environmental variability and natural fire occurrence. Maintenance burning is planned to maintain effectiveness of treatments."

Rhodes (2007) states: "The transient effects of treatments on forest, coupled with the relatively low probability of higher-severity fire, makes it unlikely that fire will affect treated areas while fuel levels are reduced." (Internal citations omitted.) And Rhodes also points out that using mechanical fuel treatments (MFT) to restore natural fire regimes must take into consideration the root causes of the alleged problem:

> In order to be ultimately effective at helping to restore natural fire regimes, fuel treatments must be part of wider efforts to address the root causes of the alteration in fire behavior. At best, MFT can only address symptoms of fire regime alteration. Evidence indicates that primary causes of altered fire regimes in some forests include changes in fuel character caused by the ongoing effects and legacy of land management activities. These activities include logging, post-disturbance tree planting, livestock grazing, and fire suppression. Many of these activities remain in operation over large areas. Therefore, unless treatments are accompanied by the elimination of or sharp reduction in these activities and their impacts in forests where the fire regime has been altered, MFT alone will not restore fire regimes. (Internal citations omitted.)

Cohen, 1999a recognizes "the imperative to separate the problem of the wildland fire threat to homes from the problem of ecosystem sustainability due to changes in wildland fuels" (Id.). In regards to the latter—ecosystem sustainability—Cohen and Butler (2005) state:

> Realizing that wildland fires are inevitable should urge us to recognize that excluding wildfire does not eliminate fire, it unintentionally selects for only those occurrences that defy our suppression capability—the extreme wildfires that are continuous over extensive areas. If we wish to avoid these extensive wildfires and restore fire to a more normal ecological condition, **our only choice is to allow fire occurrence under conditions other than extremes. Our choices become ones of compatibility with the inevitable fire occurrences rather than ones of attempted exclusion.** (Emphasis added.)

In their conclusion, Graham, et al., 1999a state:

> Depending on intensity, thinning from below and possibly free thinning can most effectively alter fire behavior by reducing crown bulk density, increasing crown base height, and changing species composition to lighter crowned and fire-adapted species. Such intermediate treatments can reduce the severity and intensity of wildfires for a given set of physical and weather variables. **But crown and selection thinnings would not reduce crown fire potential.** (Emphasis added.)

The FEIS does not disclose the project logging impacts on the rate of fire spread. Graham, et al., 1999a point out that fire modeling indicates:

> For example, the 20-foot wind speed[39] must exceed 50 miles per hour for midflame wind speeds to reach 5 miles per hour within a dense Stand (0.1 adjustment factor). In contrast, in an open stand (0.3 adjustment factor), the same midflame wind speeds would occur at only a 16-mile-per-hour wind at 20 feet.

The FEIS also fails to recognize the implications of how the fire regime is changing due to climate change.

And many direct and indirect effects of fire suppression are also ignored in the FEIS as well as in the programmatic context. For example, Ingalsbee, 2004 describes the direct, indirect, and cumulative environmental impacts of firefighting:

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[39] Velocity of the wind 20 feet above the vegetation, in this case tree tops.

Constructing firelines by handcrews or heavy equipment results in a number of direct environmental impacts: it kills and removes vegetation; displaces, compacts, and erodes soil; and degrades water quality. When dozerlines are cut into roadless areas they also create long-term visual scars that can ruin the wilderness experience of roadless area recreationists. Site-specific impacts of firelines may be highly significant, especially for interior-dwelling wildlife species sensitive to fragmentation and edge effects.

...Another component of fire suppression involves tree cutting and vegetation removal. Both small-diameter understory and large-diameter overstory trees are felled to construct firelines, helispots, and safety zones.

...A host of different toxic chemical fire retardants are used during fire suppression operations. Concentrated doses of retardant in aquatic habitats can immediately kill fish, or lead to algae blooms that kill fish over time. Some retardants degrade into cyanide at levels deadly to amphibians. When dumped on the ground, the fertilizer in retardant can stimulate the growth of invasive weeds that can enter remote sites from seeds transported inadvertently by suppression crews and their equipment.

...One of the many paradoxes of fire suppression is that it involves a considerable amount of human-caused fire reintroduction under the philosophy of "fighting fire with fire." The most routine form of suppression firing, "burnout," occurs along nearly every linear foot of perimeter fireline. Another form of suppression firing, "backfiring," occurs when firefighters ignite a high-intensity fire near a wildfire's flaming edge, with or without a secured containment line. In the "kill zone" between a burnout/backfire and the wildfire edge, radiant heat intensity can reach peak levels, causing extreme severity effects and high mortality of wildlife by entrapping them between two high-intensity flame fronts.

...Firelines, especially dozerlines, can become new "ghost" roads that enable unauthorized or illegal OHV users to drive into roadless areas. These OHVs create further soil and noise disturbance, can spread garbage and invasive weeds, and increase the risk of accidental human-caused fires.

...Roads that have been blockaded, decommissioned, or obliterated in order to protect wildlife or other natural resource values are often reopened for firefighter vehicle access or use as firelines.

...Both vegetation removal and soil disturbance by wildfire and suppression activities can create ideal conditions for the spread of invasive weeds, which can significantly alter the native species composition of ecosystems, and in some cases can change the natural fire regime to a more fire-prone condition. Firefighters and their vehicles can be vectors for transporting invasive weed seeds deep into previously uninfested wildlands.

...Natural meadows are attractive sites for locating firelines, helispots, safety zones, and fire camps, but these suppression activities can cause significant, long-term damage to meadow habitats.

The FEIS does not disclose scientifically-acknowledged limitations of the use of Fire Regime Condition Classes for the purposes the FS is using them. Fire Regime Condition Class is a metric that estimates the departure of the forest from historic fire processes and vegetation conditions. Fire regime condition class is derived by comparing current conditions to an estimate of the historical conditions that existed before significant Euro-American settlement. The FEIS does not disclose the limitations of this methodology. This method likely has very limited accuracy and tends to overestimate the risk of higher-severity fire posed by fuel loads, as documented by studies of recent fires (Odion and Hanson, 2006). Those researchers state:

> Condition Class, was not effective in identifying locations of high-severity fire. … In short, Condition Class identified nearly all forests as being at high risk of burning with a dramatic increase in fire severity compared to past fires. Instead, we found that the forests under investigation were at low risk for burning at high-severity, especially when both spatial and temporal patterns of fire are considered.

Another critique is found in Rhodes (2007) who states:

> Several of the biases …are embodied in the Fire Regime Condition Class (FRCC) approach (Hann and Bunell, 2001), which is widely used to provide an index of the potential for uncharacteristically severe fire and fire regime alteration. The FRCC relies on of estimates of mean fire intervals, but does not require that they be estimated on the basis of site-specific historical data. It emphasizes fire scar data, but does not require its collection and analysis on a site-specific basis. The FRCC's analysis of departure from natural fire regimes also relies on estimates of how many estimated mean fire intervals may have been skipped. The method does not require identification and consideration of fire-free intervals in site-specific historic record. Notably, a recent study that examined the correlation of FRCC estimates of likely fire behavior with actual fire behavior in several large fires recently burning the Sierra Nevada in California concluded: "[Fire Regime] Condition Class was not able to predict patterns of high-severity fire. . . . Condition Class identified nearly all forests as being at high risk of burning with a dramatic increase in fire severity compared to past fires. Instead, we found that the forests under investigation were at low risk for burning at high-severity, especially when both spatial and temporal patterns of fire are considered." (Odion and Hanson, 2006.) These results corroborate that FRCC is biased toward overestimating the alteration of fire regimes and the likelihood of areas burning at uncharacteristically high severity if affected by fire. Therefore, in aggregate there is medium degree of certainty that the FRCC is biased toward overestimating departures from natural fire regimes and the propensity of forests to burn at higher severity when affected by fire.

Remedy: Select the No Action alternative. Alternatively, prepare a Supplemental EIS that remedies the above noted analytic and scientific deficiencies.

DellaSala, Dominick A. and Chad Hanson, 2019. Are Wildland Fires Increasing Large Patches of Complex Early Seral Forest Habitat? *Diversity* (2019). DOI: 10.3390/d11090157

CUMULATIVE EFFECTS OF LIVESTOCK GRAZING

Impacts from livestock grazing were raised in FOC DEIS comments at pp. 5, 6, 10, 11, 13 18-19, 22, 37, 39.

It is not scientifically defensible to engage in "ecosystem restoration" via timber harvest in an area already significantly impacted by ongoing livestock grazing without including grazing in a comprehensive environmental assessment and analysis of a full range of ecological alternatives that accounts for the cumulative impacts to the degraded ecosystem from historic timber harvest, roads, fire suppression, climate change AND livestock grazing.

The most immediate progress in healing damaged riparian areas is made under rest from livestock grazing (Platts, 1991), and studies of larger-sized livestock exclosures confirm that exclusion promotes more rapid recovery of damaged riparian areas (Duff, 1977; Belsky et al., 1999).

The FEIS indicates two allotment occur in the Hungry Ridge project area. The FEIS at p. 131 says the Hungry Ridge allotment has 28,000 acres in the project area and the Butte-Gospel Allotment has 38,879 acres in the project area. This doesn't add up well because, as the FEIS indicates in multiple places, "The proposed project and direct and indirect effects analysis area consists of the Hungry Ridge project area of 29,973 acres." Regardless, a major implication is, livestock grazing could occur just about everywhere in the project area.

The FEIS states:

> The project is approximately Eighty-Six (86) percent Grand Fir and Doug Fir communities which are often characterized by a closed canopy that typically produce 100 to 200 pounds to an acre of forage which is often located along existing or abandoned roadways, small natural clearings, and transitory range created by previous timber harvest. Less than 400 acres (>1%) of the project area contains open Ponderosa Pine communities; as well as, mountain bottomlands and meadows, and grassland steppe resulting in increased forage production ranging between 500 to 2000 pounds an acre. In Ponderosa Pine communities sunlight is able to filter to the forest floor supporting both herbaceous forage and browse, such as Pine Grass, Idaho Fescue, Timothy, Orchardgrass, Intermediate Wheatgrass, Smooth and Mountain Brome. The few open, arid grassland slopes along the S.F. Clearwater River breaks are characterized by desirable cool-season native bunchgrass communities (i.e. Idaho Fescue); as well as, populations of noxious weeds, brush, and annual grasses.

The above would indicate there is limited forage for livestock over the untold tens of thousands of acres where cattle are allowed to wander in the project area. The FEIS says, "There is a need to maintain and/or increase the forage resource in the project area." Although the FEIS's Chapter 1 Purpose and Need statement doesn't admit it, clearly a purpose of the Hungry Ridge project is to improve forage for livestock. This raises serious NEPA issues with the entire Hungry Ridge project proposal.

Whereas the selected Alternative 2 involves "silvilcultural treatments on approximately 8,617 acres" the FS will be following up with 8,617 acres of vegetation treatments applied in these same places by livestock on an annual basis, as well as on an untold number of acres elsewhere in the project area. All without a proper cumulative effects analysis of serving a thinly veiled "need to maintain and/or increase the forage resource in the project area."

Impacts of continued grazing in the analysis area will include continued degradation of riparian and upland habitats; aquatic species habitats; soil erosion; invasion of weedy species; loss of fish and wildlife habitat and numbers; altered fire cycles and accelerated fragmentation of habitat; and impairment of the aesthetic, recreational and scientific experiences of public lands users. Clearing trees and other wood through logging and burning creates openings and corridors for expanding and intensifying cattle impacts into previously less accessible areas of the streams, drainage arteries and watershed uplands.

We find it difficult to understand how increasing cattle access to streams, riparian areas and other areas of dense trees, while increasing forage in those opened areas via prescribed burning and "mechanical treatments" constitutes "restoration" since what will also occur is spreading the weeds, soil damage, and other direct impacts of livestock into areas they don't currently access.

The FEIS fails to analyze and disclose the extent, degree, and significance of livestock grazing (and associated infrastructure and activities) impacts on most resources discussed in the FEIS.

Belsky and Gelbard, 2000 is a literature review of livestock as contributing to noxious weed spread.

The interactions between the invasive grass cheatgrass and fire regimes is a positive feedback system which has led to very extensive infestation in the western U.S. Wildfire and this highly flammable grass feed off each other. The plant grows well in areas that have been disturbed, so fire generally results in more cheatgrass, which results in more fire, which again results in more cheatgrass. Livestock grazing corresponds with increased cheatgrass occurrence and prevalence regardless of variation in climate, topography, or community composition (Williamson et al., 2019).

Belsky et al., 1999 is a literature review of peer-reviewed studies concerning effects of livestock grazing on water resources:

> Livestock grazing was found to negatively affect water quality and seasonal quantity, stream channel morphology, hydrology, riparian zone soils, instream and streambank vegetation, and aquatic and riparian wildlife… through direct impacts of cattle on riparian areas and aquatic habitats, as well as indirect and cumulative effects from disturbance and impairment to the watershed uplands and drainage network. An extensive body of scientific literature has developed concerning the harmful effects of domestic livestock grazing on western public lands, on the environmental effects of deforestation, and climate change stress on ecosystems and ecosystem processes.

Livestock grazing would work hand in hand with other agency policies to create the adverse effects of fire suppression claimed throughout the FEIS. Belsky and Blumenthal, 1997 investigate these impacts livestock grazing causes to stand dynamics and soils of upland forests of the Interior West.

Cumulatively, rilling, gullying, and soil erosion will accelerate due to logging, burning, and continued chronic grazing stress and overarching climate stress. Once disturbed, soils which may take millennia to form in arid lands like this can wash away in a single thunderstorm or snowmelt runoff event, or be eroded by winds. Ephemeral and intermittent drainages, including those located in areas of very erodible or unprotected soils, may suffer significant harmful impacts from livestock grazing and trampling. During spring runoff or thunderstorm events, intermittent drainages carry large flows of water, sediments, and debris.

Protective vegetative cover in uplands is usually the most important management variable affecting surface runoff and erosion from uplands that deliver runoff, sediment, and bacteria to these drainages. Extensive soil disturbance from logging, skidding, burning, bulldozing roads, and other project activities combine cumulatively with chronic grazing disturbance stressors by creating access for cattle to vacant allotment areas and previously inaccessible riparian zones.

Scientific studies have found significant reductions in runoff and sediment yield related to livestock grazing changes (Lusby, 1979).

Extensive deforestation and bulldozing roads exacerbate climate change effects – causing hotter, dry, windier local site conditions, changing local microclimate conditions. Cleared areas lose protective vegetation cover to buffer extreme rainfall or other weather events. With earlier snowmelt and runoff predicted under climate change, watersheds dry out earlier, lengthening the fire season and perennial flows are reduced. Cattle cause soil and microbiotic crust disturbance accelerating site drying and erosion, soil compaction and other impacts. This reduces the capacity of the watershed and drainage networks to absorb and slowly release water in sustainable perennial flows. Soils disturbed by logging, skidding, road bulldozing, and burning, considered cumulatively with ongoing cattle grazing and trampling disturbances, will be prone to rapid snowmelt runoff and erosion into drainage networks. Drainages subject to these kinds of cumulative ecological stressors increasingly erode, downcut, suffer accelerated runoff, and lose water holding capacity.

With the advent of climate change, air temperature increases, altered precipitation patterns, and drought periods are expected to become more frequent. One effective means of ameliorating the effects of climate change on ecosystems is to reduce environmental stressors under management control, such as land and water uses (Beschta et al., 2012). Climate change and ungulates, singly and in concert, influence ecosystems at the most fundamental levels by affecting soils and hydrologic processes. These effects, in turn, influence many other ecosystem components and processes - nutrient and energy cycles; reproduction, survival, and abundance of terrestrial and aquatic species; and community structure and composition. Moreover, by altering so many factors crucial to ecosystem functioning, the combined effects of a changing climate and ungulate use can affect biodiversity at scales ranging from species to ecosystems and limit the capability of large areas to supply ecosystem services (Christensen and others, 1996; Millenium Ecosystem Assessment, 2005b; Beschta et al., 2012).

Gerber, et al., 2013 state, "Livestock producers, which include meat and dairy farming, account for about 15 percent of greenhouse gas emissions around the world. That's more than all the world's exhaust-belching cars, buses, boats, and trains combined."

Saunois et al., 2016a note "the recent rapid rise in global methane concentrations is predominantly biogenic—most likely from agriculture—with smaller contributions from fossil fuel use and possibly wetlands. …Methane mitigation offers rapid climate benefits and economic, health and agricultural co-benefits that are highly complementary to CO_2 mitigation." (Also see Saunois et al., 2016b; Gerber et al., 2013; and the Grist articles "Why isn't the U.S. counting meat producers' climate emissions?" and "Cattle grazing is a climate disaster, and you're paying for it" and Stanford News article "Methane from food production could be wildcard in combating climate change, Stanford scientist says".)

Ripple et al. 2014 provide some data and point out the opportunities available for greenhouse gas reductions via change in livestock policy.

Beschta et al., 2012 provide a scientific basis for expecting significant environmental damage from livestock grazing with the changing climate:

- Climate impacts are compounded from heavy use by livestock and other grazing ungulates, which cause soil erosion, compaction, and dust generation; stream degradation; higher water temperatures and pollution; loss of habitat for fish, birds and amphibians; and desertification.
- Encroachment of woody shrubs at the expense of native grasses and other plants can occur in grazed areas, affecting pollinators, birds, small mammals and other native wildlife.
- Livestock grazing and trampling degrades soil fertility, stability and hydrology, and makes it vulnerable to wind erosion. This in turn adds sediments, nutrients and pathogens to western streams.
- Water developments and diversion for livestock can reduce streamflows and increase water temperatures, degrading habitat for fish and aquatic invertebrates.
- The advent of climate change has significantly added to historic and contemporary problems that result from cattle and sheep ranching.

Beschta et al., 2012 believe the burden of proof should be shifted. Those using public lands for livestock production should have to justify the continuation of ungulate grazing. Some other key points the authors make include:

- If livestock use on public lands continues at current levels, its interaction with anticipated changes in climate will likely worsen soil erosion, dust generation, and stream pollution. Soils whose moisture retention capacity has been reduced will undergo further drying by warming temperatures and/or drought and become even more susceptible to wind erosion (Sankey and others 2009).
- (I)n 1994 the BLM and FS reported that western riparian areas were in their worst condition in history, and livestock use—typically concentrated in these areas—was the chief cause (BLM and FS 1994).
- Ohmart and Anderson (1986) suggested that livestock grazing may be the major factor negatively affecting wildlife in eleven western states. Such effects will compound the problems of adaptation of these ecosystems to the dynamics of climate change (Joyce and

others 2008, 2009). Currently, the widespread and ongoing declines of many North American bird populations that use grassland and grass–shrub habitats affected by grazing are ‘‘on track to become a prominent wildlife conservation crisis of the 21st century’’ (Brennan and Kuvlesky 2005, p. 1)

- Climate change and ungulates, singly and in concert, influence ecosystems at the most fundamental levels by affecting soils and hydrologic processes. These effects, in turn, influence many other ecosystem components and processes—nutrient and energy cycles; reproduction, survival, and abundance of terrestrial and aquatic species; and community structure and composition. Moreover, by altering so many factors crucial to ecosystem functioning, the combined effects of a changing climate and ungulate use can affect biodiversity at scales ranging from species to ecosystems (FS 2007) and limit the capability of large areas to supply ecosystem services (Christensen and others 1996; MEA 2005b).
- The site-specific impacts of livestock use vary as a function of many factors (e.g., livestock species and density, periods of rest or non-use, local plant communities, soil conditions). Nevertheless, extensive reviews of published research generally indicate that livestock have had numerous and widespread negative effects to western ecosystems (Love 1959; Blackburn 1984; Fleischner 1994; Belsky and others 1999; Kauffman and Pyke 2001; Asner and others 2004; Steinfeld and others 2006; Thornton and Herrero 2010). Moreover, public-land range conditions have generally worsened in recent decades (CWWR 1996, Donahue 2007), perhaps due to the reduced productivity of these lands caused by past grazing in conjunction with a changing climate (FWS 2010, p. 13,941, citing Knick and Hanser 2011).
- Livestock use effects, exacerbated by climate change, often have severe impacts on upland plant communities. For example, … areas severely affected include the northern Great Basin and interior Columbia River Basin (Middleton and Thomas 1997).
- Livestock grazing has numerous consequences for hydrologic processes and water resources. Livestock can have profound effects on soils, including their productivity, infiltration, and water storage, and these properties drive many other ecosystem changes. Soil compaction from livestock has been identified as an extensive problem on public lands (CWWR 1996; FS and BLM 1997). Such compaction is inevitable because the hoof of a 450-kg cow exerts more than five times the pressure of heavy earthmoving machinery (Cowley 2002). Soil compaction significantly reduces infiltration rates and the ability of soils to store water, both of which affect runoff processes (Branson and others 1981; Blackburn 1984). Compaction of wet meadow soils by livestock can significantly decrease soil water storage (Kauffman and others 2004), thus contributing to reduced summer base flows. Concomitantly, decreases in infiltration and soil water storage of compacted soils during periods of high-intensity rainfall contribute to increased surface runoff and soil erosion (Branson and others 1981). These fundamental alterations in hydrologic processes from livestock use are likely to be exacerbated by climate change.
- The combined effects of elevated soil loss and compaction caused by grazing reduce soil productivity, further compromising the capability of grazed areas to support native plant communities (CWWR 1996; FS and BLM 1997). Erosion triggered by livestock use continues to represent a major source of sediment, nutrients, and pathogens in western streams (WSWC 1989; EPA 2009).

- Historical and contemporary effects of livestock grazing and trampling along stream channels can destabilize streambanks, thus contributing to widened and/or incised channels (NRC 2002). Accelerated streambank erosion and channel incision are pervasive on western public lands used by livestock (Fig. 4). Stream incision contributes to desiccation of floodplains and wet meadows, loss of floodwater detention storage, and reductions in baseflow (Ponce and Lindquist 1990; Trimble and Mendel 1995). Grazing and trampling of riparian plant communities also contribute to elevated water temperatures—directly, by reducing stream shading and, indirectly, by damaging streambanks and increasing channel widths (NRC 2002). Livestock use of riparian plant communities can also decrease the availability of food and construction materials for keystone species such as beaver (Castor canadensis).
- Livestock production impacts energy and carbon cycles and globally contributes an estimated 18% to the total anthropogenic greenhouse gas (GHG) emissions (Steinfeld and others 2006). How public-land livestock contribute to these effects has received little study. Nevertheless, livestock grazing and trampling can reduce the capacity of rangeland vegetation and soils to sequester carbon and contribute to the loss of above- and below-ground carbon pools (e.g., Lal 2001b; Bowker and others 2012). Lal (2001a) indicated that heavy grazing over the long-term may have adverse impacts on soil organic carbon content, especially for soils of low inherent fertility. Although Gill (2007) found that grazing over 100 years or longer in subalpine areas on the Wasatch Plateau in central Utah had no significant impacts on total soil carbon, results of the study suggest that ‘‘if temperatures warm and summer precipitation increases as is anticipated, [soils in grazed areas] may become net sources of CO2 to the atmosphere’’ (Gill 2007, p. 88). Furthermore, limited soil aeration in soils compacted by livestock can stimulate production of methane, and emissions of nitrous oxide under shrub canopies may be twice the levels in nearby grasslands (Asner and others 2004). Both of these are potent GHGs.
- Managing livestock on public lands also involves extensive fence systems. Between 1962 and 1997, over 51,000 km of fence were constructed on BLM lands with resident sage-grouse populations (FWS 2010). Such fences can significantly impact this wildlife species. For example, 146 sage-grouse died in less than three years from collisions with fences along a 7.6-km BLM range fence in Wyoming (FWS 2010). Fences can also restrict the movements of wild ungulates and increase the risk of injury and death by entanglement or impalement (Harrington and Conover 2006; FWS 2010). Fences and roads for livestock access can fragment and isolate segments of natural ecological mosaics thus influencing the capability of wildlife to adapt to a changing climate.
- (L)ivestock use (particularly cattle) on these lands exert disturbances without evolutionary parallel (Milchunas and Lauenroth 1993; MEA 2005a). …The combined effects of ungulates (domestic, wild, and feral) and a changing climate present a pervasive set of stressors on public lands, which are significantly different from those encountered during the evolutionary history of the region’s native species. The intersection of these stressors is setting the stage for fundamental and unprecedented changes to forest, arid, and semi-arid landscapes in the western US (Table 1) and increasing the likelihood of alternative states. Thus, public-land management needs to focus on restoring and maintaining structure, function, and integrity of ecosystems to improve their resilience to climate change (Rieman and Isaak 2010).

- Natural floods provide another illustration of how ungulates can alter the ecological role of disturbances. High flows are normally important for maintaining riparian plant communities through the deposition of nutrients, organic matter, and sediment on streambanks and floodplains, and for enhancing habitat diversity of aquatic and riparian ecosystems (CWWR 1996). Ungulate effects on the structure and composition of riparian plant communities (e.g., Platts 1991; Chadde and Kay 1996), however, can drastically alter the outcome of these hydrologic disturbances by diminishing streambank stability and severing linkages between high flows and the maintenance of streamside plant communities. As a result, accelerated erosion of streambanks and floodplains, channel incision, and the occurrence of high instream sediment loads may become increasingly common during periods of high flows (Trimble and Mendel 1995). Similar effects have been found in systems where large predators have been displaced or extirpated (Beschta and Ripple 2012). In general, high levels of ungulate use can essentially uncouple typical ecosystem responses to chronic or acute disturbances, thus greatly limiting the capacity of these systems to provide a full array of ecosystem services during a changing climate.
- (F)ederal grazing fees on BLM and FS lands cover only about one-sixth of the agencies' administration costs (Vincent 2012).

Remedy: Select the No Action alternative. Alternatively, prepare a Supplemental EIS that addresses the analytical and scientific issues identified above.

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SCIENTIFIC INTEGRITY

FOC comments on the DEIS at pp. 32-33 discussed these various related issues. We also raise the issue of reliability of data and validity of monitoring in other portions of our comments.

The FS has not disclosed the statistical reliability of the data the FS relies upon for the Hungry Ridge 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, 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 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 Hungry Ridge project analyses, which begins to address model validity.

In fact, the Forest Plan requires 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." Again, the FS has not validated such models.

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 FEIS 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 NPCNF's Clear Creek Integrated Restoration Project FEIS, the FS 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 G-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 FEIS'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 FEIS'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). USDA Forest Service, 2000c (a FS forest plan monitoring and evaluation report) provides an example of the agency acknowledging the problems of data that are 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… .

In the above case, the FS expert believed the data were unreliable, limiting the usefulness and applicability (validity) of the model.

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,

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

evaluating their validity. Three of their criteria are especially relevant to this discussion:

Output definition	Is the output well defined and will it translate to something that can be measured?	1 = difficult 2 = moderate 3 = easy
	acceptance by an array of professionals?	application of the modeling framework

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 DEIS was ignored or dismissed without discussion.

The FEIS violates NEPA because the FS has not insured the reliability of data input to the models, the FS has not validated the models for the way the FEIS 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 a Supplemental EIS that addresses the analytical and scientific issues identified above.

TEMPORARY ROADS

FOC raised issues with temporary roads in DEIS comments (pp. 2, 11, and 21) because the roads the FS builds are often not really temporary. Once built, they either remain or are "decommissioned" to "templates" or "prisms", which make them available to be recommissioned, which means their impacts on the landscape are not temporary.

The FEIS states, "most of the proposed temporary roads are on existing road prisms."

Either these road prisms were a result of decommissioned or abandoned temporary roads or decommissioned Forest System roads. Either way, that the FS is going to reconstruct temporary roads overtop of these "prisms" sets decommissioned roads' recovery back to the beginning. Because these "existing road prisms" will be once again used for roads, from the benefit of retrospect, they have had a much longer-term impact than what the FS originally represented. Taking that lesson, the FS needs to figure out—before signing a decision—how many miles of new temporary road it is going to build, because history suggests that even after decommissioning, these roads will not be gone and there will be a road there for a long time.

FOC explained it this way in our Objection to the End Of The World Project:

> The FS mechanism for decommissioning roads will likely not work, and the EA does not have a back-up plan for road decommissioning. The Forest Service stated on EA p. 7, "These road prisms will be obliterated/recontoured after use. (Implemented through mandatory contract provisions B6.63, C6.632#, and C6.633#)." However, road aren't always decommissioned through "mandatory contract provisions" when the Forest Service is also doing prescribed burns. Even though the Forest Service cited contract provision B6.63, the following provision, B6.631, directs the logger to leave temporary roads open for Forest Service "treatment." C6.632# and C6.633# are equally ineffective, as they only require the logger to obliterate or scarify "unless otherwise agreed" or "unless waived in writing." When that happens, the contract will end, and the timber company will be released of further obligations while the temporary road is still on the landscape. Then there will be no mechanism to decommission it.

We observed this unfold during implementation of the Orogrande Community Protection Project, where there is now a road in a roadless area. A temporary road was proposed, approved, and punched into a roadless area. The mechanism by which the FS intended to decommission the temporary road, as outlined by the EA, was by logging contract. However, the actual Orogrande logging contract re-numbered the temporary road and only required the logging contractor to decommission a third of that temporary road—2/3 of the temporary road was to remain open for FS "treatment." The logging contract terminated, releasing the logging company from all obligations. And presently 2/3 of the temporary road (that the FS said would be decommissioned by logging contract) still exists and there are now no definite plans to decommission it. Friends of the Clearwater recently emailed a letter describing this issue to the regional forester and to the forest supervisor, and the full details of how temporary roads are forgotten are described in that letter.[40] We incorporate it here because the same narrative is poised to play out again. Because the Hungry Ridge FEIS does not account for how this could easily play out in the implementation of this project, it omits discussion of a significant and important set of potential impacts.

Finally, we note the FEIS specifies, "road decommissioning through abandonment would include stabilizing and seeding sources of erosion but would **leave the road prism intact**." (Emphasis added.)

TRAVEL MANAGEMENT

Our DEIS comments at pages 2-4 discuss travel management, including the impacts of roads and some of their indirect effects.

Our comments asked, "What is the best available science the FS relied upon to conduct the 'the six-step process as defined in the Travel Analysis publication FS-643'? …What is the best

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[40] We include these documents into our objection. They are "R1 NPCNF letter re Orogrande temp road and roadless_11-1-19"; "R1 NPCNF Orogrande letter Attachment 1 Orogrande EA excerpts"; "R1 NPCNF Orogrande letter Attachment 2-Timber Contract Excerpts"; R1 NPCNF Orogrande letter Attachment 3 Contract map.

available science the FS relied upon for this forestwide transportation analysis?" The FS did not respond to our inquiry as to how the analyses were consistent with the Travel Management Regulations (36 CFR 212) Subpart A requirement to conduct a *science-based analysis* to identify the minimum road system needed to manage the Forest ecologically sustainably and within expected budgets. Friends of the Clearwater's August 29, 2014 Travel Analysis letter is incorporated within this Objection, and is included as Attachment 7.

The FEIS states, "Approximately 25 to 33 miles of roads no longer needed for management would be decommissioned through either recontouring or abandonment." Our DEIS comments asked:

> The DEIS proposes road decommissioning including "Abandonment": "If the road is currently revegetated and stable with **no culverts**, it will be abandoned. Roads proposed for abandonment are often ridgetop roads on gentle slopes with **few, if any, culverts."** Which is the FS proposing—abandonment with no culverts or abandonment with a few culverts? … The DEIS proposes road decommissioning including "Abandonment": "If the road is currently revegetated and stable with **no culverts**, it will be abandoned. Roads proposed for abandonment are often ridgetop roads on gentle slopes with **few, if any, culverts."** Which is the FS proposing—abandonment with no culverts or abandonment with a few culverts?

The FS responded, "See FEIS, Chapter 2, Alternatives - Road Activities description." However, the FEIS does not answer the question, except perhaps indirectly where it states: "The typical costs for decommissioning a road are approximately $5,000/mile by recontouring and $0/mile for abandoning." Therefore we take it that since abandoning roads would cost nothing, nothing is also what would be done with those "few culverts" that might exist in abandoned roads, nothing will happen as far as decompaction or other ecological restoration. As the FEIS itself states, "Decommissioning roads through full recontour, storage of roads and trail conversion would improve previously impacted road beds through decompaction, addition of organic material, revegetation of bare areas, and weed control (Lloyd et al. 2013)." Furthermore since abandoned roads would no longer be on the FS road system, nothing will be spent on maintenance. Really, though, the FS doesn't seem to care enough to look into the situation and answer the question. The FS simply does not analyze the potential impacts of abandoning culverts to clogging and potential catastrophic failure or any erosion at all.

The FS is playing similar nondisclosure games with its road inventory. It's clear, based on the FEIS and from other projects on these Forests, that the FS is making it standard practice to re-use "abandoned" road templates—and even roads actively decommissioned—not including them on the official road inventory therefore constantly avoiding responsibilities, regulations, and forest plan requirements for roads.

Our comments stated:

> "Construct approximately 6.5 miles of temporary roads over previously abandoned roads to facilitate harvest." Thus we see that "temporary" roads are really permanent.

The FS's response? None whatsoever. By now of course, an honest response would obviously be, the FS intends that they never really go away. "Temporary road" is a fictitious concept—much of the impact will affect the landscape indefinitely.

We also stated: “The DEIS does not show how adequate annual maintenance funding will exist for the post-project road network, and doesn’t disclose how deferred maintenance needs or costs might increase or decrease post-project.” Again, this is a concern because roads not properly maintained have caused chronic ecological stress to watersheds and damage other resources. The FS did not respond to this comment, revealing an agency apparently willing to evade legal requirements and responsibilities to the owners (public) and occupiers (wildlife, fish, etc.) of the Forest while creating more and more industrialized conditions on the land.

Our DEIS comments stated, “The DEIS doesn’t disclose the likelihood of each alternative covering all the costs of proposed restoration activities such as road decommissioning, culvert upgrades, etc.” The implication of the comment is obvious—we are concerned that the FS is making restoration promises it cannot keep. They answer:

> Any additional non-commercial activities may have any number of funding sources, or a combination of funding sources. It is unreasonable to speculate what those funding sources might be for this wide variety of projects. Funding for road obliteration, culvert removal and meadow restorations may be provided by timber sales, including the proposed actions, and the implementation could be performed with stewardship contracts. (Emphases added.)

So in other words, we ask about the “likelihood” and receive no answer.

Harry Jagemon stated in a similar vein, “There are no requirements to complete any of the water quality improvement projects prior to implementation of the timber sale.” The closest the FS came to answering was: “Road reconstruction and maintenance is generally performed prior to and after timber harvest to facilitate log haul and then return the road to proper functioning condition.” However his question was not about maintenance—it was about the same restoration activities we ask about, and for which the FS is apparently making no commitments to actually perform.

The FS tries to steer the issue back toward maintenance, saying “A variety of funding mechanisms are utilized for maintaining forest roads.” However the agency even evades the implications of its own diversion and attempted distraction. We asked, “The DEIS does not include an analysis of the cumulative impacts of untreated roads. This would include the likely impacts due to the high risk that unmaintained or undersized culverts will result in catastrophic failure.” Unsurprisingly, no answer.

We also asked: “After all project activities are done, assuming there won’t be enough funding to perform regular maintenance on all project area roads, how does the DEIS quantify those ongoing cumulative effects?” That was a question about ongoing cumulative effects, right? In response the FS mumbles something about “as funding is available.”

We raise the same issue, different wording: “The DEIS does not show how adequate annual maintenance funding will exist for the <u>post-project</u> road network, and doesn’t disclose how deferred maintenance needs or costs might increase or decrease post-project.” Again, complete FS evasion of the issue.

We can understand that the FS doesn't want to be held accountable for the failure of Congress to appropriate enough money for the agency to do its job adequately, but it is disingenuous and unethical to pretend the ongoing ecological damage is a non-issue. This is also illegal under NEPA.

Forestwide, roads are not being maintained as needed: "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.

The NPCNF's End of the World EIS notes that "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."

The 2006 Roads Analysis Report acknowledges:

> Some roads are causing adverse impacts, such as sedimentation in streams, wildlife impacts, and reduced access due to landslides, and should be evaluated for mitigation projects at the sub-forest level.
>
> Roads in streamside or valley bottom locations disrupt the riparian areas through constriction, removal of woody debris and shade, introduction of sediment, reduction in leafy primary production, and through increased hazard of introduction of toxic pollutants to the stream.
>
> Roads can alter physical channel dynamics, including isolating floodplains, constraining channel migration, and movement of large wood, fine organic matter, and sediment. This happens most at road-stream intersections and where roads are within close proximity to streams. Of the 3873 miles of National Forest system roads, approximately 23 percent exist within 300 feet of stream channels.
>
> Wolverines are the most sensitive MIS species to motorized access. They typically inhabit remote mountainous areas where human disturbance is lower. Wolverines typically avoid human disturbance and roaded landscapes.
>
> Standing and down dead wood is important to pileated woodpecker and marten habitat. Roads facilitate the removal of these habitat components for firewood. A major implication is that some MIS habitats are likely underused.

Our DEIS comments asked, "Please disclose the Road Management Objectives and Trail Management Objectives of each road and trail segment in the project area, as well as for all system roads and trails proposed for construction or addition to the system." The FS responds with a reference to the ROD and ultimately to its Table 3, which lacks most the requirements we cite from agency directives: the intended purpose, design criteria (FSM 2353.26 and 7720), and operation and maintenance criteria (FSM 2353.25 and 7730.3) for each NFS road and NFS trail.

Our comments stated:

> The DEIS does not demonstrate the FS is managing the project area and forest consistent with 36 CFR 212 Subparts B and C. The FS proposes to increase motorized recreation in some areas without a full analysis of the increased motorized impacts on many resources. The DEIS doesn't adequately analyze cumulative impacts of winter motorized travel. It doesn't demonstrate consistency with the Travel Management Rule requirements that off-road motorized travel impacts be minimized.

The FS responded, "Non-system roads are not maintained and usually do not have culverts or designed structures. Non-system alignments not used in project are not disturbed. Those used for Temp Roads are recontoured." They may have just as well have said the capital of Hawaii is Honolulu—same irrelevance.

The FEIS states:

> Decommissioning of roads can effect livestock management by closing trailing routes, closing routes to salting grounds, reducing watering access, and reduce access to maintain range improvements. If decommissioning results in the obliteration of roads, issues can be minimized by **leaving a trail free of debris and adequate to support trailing and herding of livestock**. (Emphasis added.)

It is difficult to understand how such actions as highlighted above would be in compliance with the Travel Management Rule.

Our comments noted the DEIS states, "A road inventory was completed in the project area watersheds in 2012." We asked, "Was the thoroughness of that inventory comparable to the survey conducted by Fly, et al. 2011, which was a survey of sediment sources in a project area on the Boise National Forest?" We were referring to a FS road survey completed according to the FS' own Geomorphic Road Analysis and Inventory Package (GRAIP)[41] methodology, which the FS performed to "specifically quantified the extent and location of sediment contributions from roads to streams" in the 29.9 mi^2 Scriver Creek sub-watershed of the Boise NF. In the Boise NF, as we noted in our comment. The FS couldn't resist responding condescendingly, "This project is on the Nez Perce-Clearwater National Forest." The FS insults a relevant, informed question apparently to distract from the fact that it doesn't want to answer.

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[41] "The GRAIP system consists of a detailed, field-based road inventory protocol combined with a suite of geographic information system (GIS) models. The inventory is used to systematically describe the hydrology and condition of a road system using Geographic Positioning System (GPS) technology and automated data forms (Black, Cissel, and Luce 2009). The GIS models use these data to analyze road-stream hydrologic connectivity, fine sediment production and delivery, upstream sediment accumulation, stream sediment input, shallow landslide potential with and without road drainage, gully initiation risk, and the potential for and consequences of stream crossing failures. Detailed information about the performance and condition of the road drainage infrastructure is also supplied. The inventory was conducted in accordance with the Quality Assurance Project Plan (QAPP) developed in cooperation with the USEPA and the RMRS (Black et al. 2009)." Fly, et al. 2011.

The FEIS also fails to demonstrate consistency with Forest Plan Roads and Trails standards, including #4 which states:

> An Access Management Plan will be implemented to monitor and evaluate the effects of access on forest resources and the ability of the transportation system to accomplish the designed use. As measuring or monitoring tools, Forest access management will use two indices[42] to monitor change over time. These indices will allow us to compare between points in time, between areas, and between alternate access management schemes or proposals.

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.)

Friends of the Clearwater'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.)

[42] These two Forest Plan indices are Road Density Index and Distribution Index.

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.

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 FEIS 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 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 Hungry Ridge. 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.)

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 Lolo NF (Riggers, et al. 1998) is a testament to the failure of the agency's BMP approach.

The FEIS fails to provide sufficient evidence or monitoring data demonstrating BMP effectiveness.

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 entitled, *Effectiveness of Best Management Practices that Have Application to Forest Roads: A Literature Synthesis* summarized research and monitoring on the effectiveness of different BMP treatments (Edwards et al., 2016). They 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 (*Id*). 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., 2011).

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 Forest Service must 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 Forest Service 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.)

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 a 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.

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:

> 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.
>
> 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:

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:

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.

Forest Plan Roads and Trails Standards state:

1. Develop an "Area Transportation Analysis" prior to entering drainages with land-disturbing activities.
2. Analyze the economics of proposed access developments using proven tools, and incorporate them into the project design.
3. Evaluate all facilities using the Access Management Analysis Worksheet to determine use restrictions and access needs. This worksheet will be an integral part of the Decision Document.
4. An Access Management Plan will be implemented to monitor and evaluate the effects of access on forest resources and the ability of the transportation system to accomplish the designed use. As measuring or monitoring tools, Forest access management will use two indices to monitor change over time. These indices will allow us to compare between points in time, between areas, and between alternate access management schemes or proposals.

The FEIS fails to demonstrate compliance with all these Standards, in violation of the Forest Plan and NFMA. The FEIS 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.

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 completed forest-wide TAP and includes alternatives that implement the minimum road system, and that complies with Forest Plan Roads and Trails Standards.

Anderson, C.J.; Lockaby, B.G. 2011. Research gaps related to forest management and stream sediment in the United States. Environmental Management. 47: 303-313.

Carlson, J. P. Edwards, T. Ellsworth, and M. Eberle. 2015. National best management practices monitoring summary report. Program Phase-In Period Fiscal Years 2013-2014. USDA Forest Service. Washington, D.C.

Edwards, P.J., F. Wood, and R. L. Quinlivan. 2016. Effectiveness of best management practices that have application to forest roads: a literature synthesis. General Technical Report NRS-163. Parsons, WV: U.S. Department of Agriculture, Forest Service, Northern Research Station. 171 p.

Halofsky, J.E. et al. eds., USDA, Forest Service, Pacific Northwest Research Station, Adapting to Climate Change at Olympic National Forest and Olympic National Park, PNW-GTR-844 (2011). Available at https://www.fs.fed.us/pnw/pubs/pnw_gtr844.pdf

Schmitz, O.J. and A.M. Trainor, Adaptation Approaches for Conserving Ecosystem Services and Biodiversity in Dynamic Landscapes Caused by Climate Change, USDA Forest Service RMRS-P-71 (2014).

Strauch, R.L. et al., Adapting transportation to climate change on federal lands in Washington State, Climate Change 130(2), 185-199 (2015).

VIABILITY AND DIVERSITY

FOC comments on the DEIS clearly raise viability at pages 23 and 26. We also extensively discuss old growth at pp. 23-25.

A. Population Viability

The 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.”

Forest Plan Wildlife and Fish Standard #1 requires the FS to “Maintain viable populations of existing native and desirable non-native vertebrate wildlife species.” Forest Plan Wildlife and Fish Standard #7 requires the FS to “Provide management for minimum viable populations of old-growth and snag- dependent species by adhering to the standards stated in Appendix N.”

Forest Plan Wildlife and Fish Standard #3 requires the FS to:

> Monitor population levels of all Management Indicator Species on the Forest. These include bald eagle, grizzly bear, gray wolf, peregrine falcon, elk, moose, bighorn sheep, pileated woodpecker, goshawk, pine marten, fisher, westslope cutthroat trout, summer steelhead, and spring chinook. These species have been selected because (a) they are threatened and endangered; (b) they have special habitat needs that may be influenced

significantly by planned management programs; (c) they are commonly hunted, fished, or trapped; (d) they are non-game species of special interest; or (e) their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality.

Population levels will be monitored and evaluated as described in the Forest Plan Monitoring Requirements (Chapter V of the Forest Plan).

The goals for the Nez Perce National Forest include:

3. Provide and maintain a diversity and quality of habitat to support viable populations of native and desirable non-native wildlife species.

Forest Plan Objectives include:

Viable populations of old-growth-dependent species will be maintained. At least 10 percent of the forested acres across the Forest that are suitable old-growth habitat will be managed as old-growth habitat. This acreage will be distributed across the Forest in a way which assures that at least 5 percent of the forested acres within major prescription watersheds of 6,000 to 10,000 acres will be managed as old-growth habitat.

Habitats will be maintained to provide for population viability of all sensitive species including the wolverine, big-eared bat, Harlequin duck, boreal owl, and common loon. Important habitat components include riparian zones, caves, mine shafts, snags, and large open waters. Management actions will acknowledge and protect other key habitat components important to these species as they are discovered and accepted.

The FEIS fails to demonstrate consistency with the above Forest Plan viability direction.

Two Old Growth Analysis Areas (OGAAs) already fall below the 5% distribution objective (03050112 is at 3.4% and 03050116 is at 2.5%). Yet the selected alternative would log 117 and 97 more acres of old growth in those OGAAs, respectively. And these figures don't even consider the inflated nature of the FS's estimates, based upon use of North Idaho Old Growth (Green et al., 1992) criteria.

Recalculating using only the Forest Plan definition of old growth—which is how the Forest Plan was designed to be implemented—the number of OGAAs meeting the 5% distribution objective drops. OGAA 03050102 has only 2.8% and OGAA 03050118 has 0.6%.

The FS exhibits little restraint on this issue, as project file documents indicate the FS is proposing to clearcut ("regeneration") a total of 521 acres of old growth and "intermediate" log another 80 acres.

The Wildlife Report asserts: "The popular notion of 'hands off' management is not ecologically sound in xeric forest types, and will result in long-term loss of the older ponderosa pine and western larch late-seral forest conditions that have occupied this area for centuries and are important and desirable to keep." This is not consistent with the Forest Plan view of old growth, nor its FEIS. At the time the Forest Plan was adopted, logging within old growth was not accepted as having any proven restorative or preservative function. So the FS is relying upon information (actually, speculation) generated after the Forest Plan was adopted to justify logging old growth[43].

However, also a more recent issue is questioning of the scientific adequacy of the forestwide 10% standard. Our comments on the DEIS asked, "Please disclose the natural historic range vs. current conditions regarding patch size, edge effect, and amount of interior forest old growth in the project area and forestwide. Please **estimate** how much old growth in the project area has been destroyed by logging. What is the HRV for old growth forestwide?" The FS responded, "Estimating the amount of old growth that was historically present in the project area would be speculative." That is bizarre—the FS has no qualms about speculating on the amounts of various other categories of forest in the project area, and basing the goals of this project on such speculation. Yet it won't speculate on the amount of old-growth habitat historically needed to maintain viability of its old-growth Management Indicator Species and other old-growth associated wildlife? The FS may be reluctant to discuss the issue because the amount of old growth on the Forest is well below the historic range; and that fact alone shows how the FS is managing inconsistent with best available science in proposing to destroy hundreds of acres of old growth.

Our comments asked, "Please list the best available science upon which the Forest Plan old-growth standards are based." The FS responded, "A discussion of literature supporting Forest Plan standards is outside the scope of this project-level analysis.

For the End Of The World Project, the Overview for Wildlife Specialist Report states:

> …clearcut harvests have contributed to forest conditions and landscape patterns that differ from those that would have occurred in the absence of such actions. …Early- and **late-successional forest stages have been reduced in extent** and diversity of patch size. (Emphasis added.)

So it is without doubt that the amount of old growth on the Forest and in the Project Area are well below the HRV. The FS has not analyzed the wildlife viability implications of managing the Forest well outside the HRV for old growth, based upon the best available scientific information.

Also indicative of the Forest Service's old-growth logging agenda is an important difference between the Forest Plan Appendix N standards and the Green et al., 1992 criteria. Forest Plan Appendix N standards require "(a)t least 15 trees per acre greater than or equal to 21 inches diameter at breast height (DBH)." For every forest type of the Green et al., 1992 criteria) the required minimum number of trees/acre is less, or the required minimum diameter of large trees is lower—or both. Without disclosure or analysis, the FS is attempting brush off this significant difference.

[43] Yet it does so in the absence of proper procedures as per planning rule requirements of plan amendments.

Jahn, 2012, who assists the FS in understanding the intention of Forest Plan Appendix N direction, notes that Thomas, et al., 1979 "was considered the best science on the subject." The Thomas et al., 1979 definition of an old-growth stand is:

> **…**a stand that is past full maturity and showing decadence; the last stage in forest succession; the USDA Forest Service's working definition for old-growth stands in the Blue Mountains is 37 live trees or more per hectare (15/acre) over 53-centimeter (21-in) d.b.h., 1.2 or more snags per hectare (0.5 snag/acre) over 53- centimeter (21-in) d.b.h., two or more canopy levels, heart rot and other signs of stand decadence present and obvious, overstory canopy closure of 10-40 percent, usually with a definite shrub-sapling layer with a canopy closure of over 40 percent, with understory and overstory canopy combined exceeding 70 percent, and logs obvious on the ground.

We note that definition is much more consistent with Appendix N criteria than is Green et al., 1992.

To be sure, there are problems with Forest Plan Appendix N standards that ought to be dealt with by a forest plan amendment. But the problems are with the very foundation of the quantitative habitat standard, not necessarily with the stand-level attributes. Forest Plan Appendix N standards state:

> **Minimum Requirements for Amount and Distribution of Old Growth**. Current information indicates that, in order to maintain a viable population of old-growth-dependent species, it is necessary to maintain 10 percent of the total forested acres as old growth with no less than 5 percent of the forested acres maintained as old growth within each prescription watershed or combination of watersheds totalling 5,000 to 10,000 acres.

There is no scientific basis for the "Current information" the Forest Plan is referring to. On the other hand, much scientific information indicates that 10% old growth forestwide is outside the range of reference conditions. For example, the NPCNF's Clear Creek FEIS Appendix G states:

> The Nez Perce Clearwater Forest Plan Revision, Planning Set of Documents (2010) and the Analysis of the Management Situation (2003) summarize the following needs to maintain terrestrial sustainability and desired conditions.
>
> - Increase the amount of …old growth forests;
> - Increase patch size in the large size class and also old growth, decreasing fragmentation of these forests;

In the NPCNF's Clear Creek Project File document 111017WildlifeNFMACommentsMR.docx, the question, "What do you want it to be? (Desired Conditions)..." is answered, in part:

> Management Indicator Species (MIS)
>
> Fisher: In VRUs 7 and 17, assure 40+% of the landscape is available as contiguous forest patches large standing and down dead trees, connected by forested riparian habitats.

VRU Desired Distributions	Young	Mid-Seral	Mature	Old (Forest Plan = 10%)
1	20-40%	40-60%	15-20%	5-10%
3	15-25	15-35	10-30	20-50
7	10-20	15-35	10-30	35-65
8	15-25	20-40	15-35	10-40
10	10-20	10-30	10-30	35-65
12 stream breaklands; bunchgrass and shrublands				
17	10-20	15-35	10-30	25-55

> The availability of mature **and older** forest habitats, well-distributed within desired patch sizes and occupying 40%+ ...of upland landscape, would assure opportunities for full habitat occupancy for American marten, fisher, and breeding pairs of northern goshawk, pileated and black-backed woodpeckers.

The FS must develop a transparent, well thought-out long-term strategy for old-growth associated wildlife species viability in a properly-defined cumulative effects analysis area." Unfortunately, nothing in the FEIS resembles such a strategy.

We incorporate by reference FOC's April 13, 2015 objection to the draft Record of Decision for the Clear Creek Integrated Restoration Project and final Environmental Impact Statement, as providing further insight into the old-growth policy and old-growth associated wildlife on the NPNF.

Ten percent old growth, the forestwide Standard, isn't even within the FS's own "Desired Distributions" for VRUs 3, 7, 10, and 17, and is at the low end for VRU 8.

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 **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.

If the FS was interested in making its old-growth standards consistent with the best available science, it would undertake an amendment process that would increase its "minimum[44]" 10% standard (and the 5% distribution standard) up to a level within the natural range of variability, resembling reference conditions. Unfortunately, it looks as though the Nez Perce National Forest had its preferred "expert" weigh in on this topic: "The Ranger has indicated he is not interested in increasing old growth, believing there is enough OG out there." (111017WildlifeClearCreekNFMAComments.docx)

Jahn, 2012 is a report on the project website, commissioned by the NPNF apparently to help the FS sort out its confusion concerning its own Forest Plan Appendix N direction for old growth. Jahn, 2012 states, "At the time of the 1987 NPNF Plan, the work of Thomas and others[45] was considered the best science on the subject." Jahn also states, "there is little, if any, available documentation or evidence of forest planning interdisciplinary team deliberations that suggests the incorporation or use of any other old growth management research material."

We note that Thomas, et al., 1979 also provided the NPNF with no basis for its 10% forestwide old-growth standard.

Whereas the North Idaho Old Growth criteria recognizes the lodgepole pine old growth type, the FEIS fails to justify its claim that lodgepole pine old growth is somehow irrelevant: "The objective was to identify old growth for long-term habitat management, therefore lodgepole pine dominated stands were not considered for old growth habitat."

Management of Forest Plan Management Area 20 lands prioritizes "critical habitat for wildlife species dependent on old-growth forest conditions."

Forest Plan Appendix N identifies the Forest Plan old-growth management indicator species (MIS):

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[44] http://dictionary.reference.com defines "minimum" as: "least possible."

[45] Thomas, J.W. (tech ed.) 1979. Wildlife Habitats in Managed Forests, the Blue Mountains of Oregon and Washington. USDA Forest Service, Ag. Handbook No. 553. Wildl. Manag. Instit. Washington D.C.

> For the Nez Perce National Forest the primary indicator species are pileated woodpecker, goshawk, and fisher. Pine martin (sic) is considered a secondary indicator species because it inhabits both mature and old-growth stands.

Forest Plan Appendix N also explains the basis for the use of old-growth MIS as a proxy for viability of other species associated with old growth:

> Old-growth indicator species are those species of wildlife that are dependent on or that find optimum habitat in old-growth stands for at least part of their life cycle. It is assumed that if the requirements of these species are met, the requirements of other old-growth associated species will be satisfied.

In other words, if viability is not being assured for the old-growth MIS, it is also not being assured for the Sensitive, Threatened, and Endangered species that fulfill important life history needs by utilizing key old-growth forest attributes.

Schultz (2010) provides a critique of FS wildlife analyses the most prominent being they are based on habitat availability, which alone is insufficient for understanding the status of populations (Noon et al. 2003, Mills 2007). Schultz (2010) recommendations generally call for more peer review of large-scale assessments and project level management guidelines, and to adopt more robust scientifically sound monitoring and measurable objectives and thresholds if maintaining viable populations of all native and desirable non-native wildlife species is to be accomplished.

Traill et al., 2010 and Reed et al., 2003 are published, peer-reviewed scientific articles addressing what a true "minimum viable population" would be, and how that number is typically drastically underestimated. The FS has not identified the best available science that provides scientifically sound, minimum viable populations of any Sensitive species or MIS on the NPCNF.

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 forestwide 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 this has never been done by the FS. It is also of paramount importance to monitor population during the implementation of the Forest Plan in order to validate assumptions used about long-term species persistence i.e., population viability (Marcot and Murphy, 1992; Lacy and Clark, 1993).

In the absence of meaningful thresholds of habitat loss and no monitoring of wildlife populations at the Forest level, projects will continue to degrade wildlife habitat across the Forest over time. (See also Schultz 2012.). The FS would never be able to detect the likelihood of complete extirpation of any wildlife species, using such methodology.

The FS relies upon Region-wide database analyses such as FIA or upon analyses by Samson to conclude that species viability is assured for various wildlife species of concern on the NPCNF. However, those reports have not been subject to scientific peer review and thus fail to meet the best available science standard. The Samson reports rely upon the databases of outdated, unreliable information as its quantitative source. The FS does not address the age and reliability of the data.

FOC Comments:

> How many FIA plot surveys (locations in the project area) show the plot meets either North Idaho old growth (Green et al.) or Forest Plan old-growth criteria?
>
> How many FIA plot survey locations in Nez Perce National Forest fall within MA 20? Of those, how many actually meet either North Idaho old growth (Green et al.) or Forest Plan old-growth criteria?

FS response: "The exact locations of FIA plots are not disclosed to the Forest." In other words nobody—not members of the public, and not even the ID Team or Responsible Official—can verify the data upon which many FEIS analyses are based.

Sampson did not evaluate long-term viability for the fisher and marten, but did 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." 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 (ne - 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 over 20 years old. There have been more wildfires in this time frame, and more large timber sales.

The FEIS responds to some of the problems we identified of Samson's conclusions for longer term viability, basically concluding "Providing for ecosystem sustainability and the long-term viability for the four species under consideration in this assessment requires a much larger, more widespread and active vegetation management program than evident today." Again, we see the need for independent peer review here.

B. Habitat fragmentation and connectivity.

Assuring viability also means addressing the issue of fragmentation, road effects, and past logging on wildlife species' habitat. Viability is only assured if individuals of a species can survive migration and dispersal for genetic diversity. The Forest Plan lacks meaningful direction maintaining landscape connectivity for wildlife. Lehmkuhl, et al. (1991) state:

> Competition between interior and edge species may occur when edge species that colonize the early successional habitats and forest edges created by logging (Anderson 1979; Askins and others 1987; Lehmkuhl and others, this volume; Rosenberg and Raphael 1986) also use the interior of remaining forest (Kendeigh 1944, Reese and Ratti 1988, Wilcove and others 1986, Yahner 1989). Competition may ultimately reduce the viability of interior species' populations.
>
> Microclimatic changes along patch edges alter the conditions for interior plant and animal species and usually result in drier conditions with more available light (Bond 1957, Harris 1984, Ranney and others 1981).
>
> Fragmentation also breaks the population into small subunits, each with dynamics different from the original contiguous population and each with a greater chance than the whole of local extinction from stochastic factors. Such fragmented populations are metapopulations, in which the subunits are interconnected through patterns of gene flow, extinction, and recolonization (Gill 1978, Lande and Barrowclough 1987, Levins 1970).

The Wildlife Report states, "Implementation of the action alternatives would add to forest fragmentation levels in the project area, which would be cumulative to past, present, and other foreseeable harvest activities in these drainages."

In terms of "quality of habitat" the continued fragmentation of the NPCNF is a major ongoing concern. It is documented that edge effects occur 10-30 meters into a forest tract (Wilcove et al., 1986). The size of blocks of interior forest that existed historically before management (including fire suppression) was initiated must be compared to the present condition. USDA Forest Service, 2004a states:

> Forested connections between old growth patches …(widths) are important because effective corridors should be wide enough to "contain a band of habitat unscathed by edge effects" relevant to species that rarely venture out of their preferred habitats (Lidicker and Koenig 1996 and Exhibit Q-17).

Timber harvest patterns across the Interior Columbia River basin of eastern Washington and Oregon, Idaho, and western Montana have caused an increase in fragmentation of forested lands and a loss of connectivity within and between blocks of habitat. This has isolated some wildlife habitats and reduced the ability of some wildlife populations to move across the landscape, resulting in long-term loss of genetic interchange (Lesica 1996, U.S. Forest Service and Bureau of Land Management 1996 and 1997).

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."

Harrison and Voller, 1998 assert "connectivity should be maintained at the landscape level." They adopt a definition of landscape connectivity as "the degree to which the landscape facilitates or impedes movement among resource patches." Also:

> Connectivity objectives should be set for each landscape unit. …Connectivity objectives need to account for all habitat disturbances within the landscape unit. The objectives must consider the duration and extent to which different disturbances will alienate habitats. … In all cases, the objectives must acknowledge that the mechanisms used to maintain connectivity will be required for decades or centuries.

(Id., internal citations omitted.) Harrison and Voller, 1998 further discuss these mechanisms:

> Linkages are mechanisms by which the principles of connectivity can be achieved. Although the definitions of linkages vary, all imply that there are connections or movement among habitat patches. Corridor is another term commonly used to refer to a tool for maintaining connectivity. …the successful functioning of a corridor or linkage should be judged in terms of the connectivity among subpopulations and the maintenance of potential metapopulation processes. (Internal citations omitted.)

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.

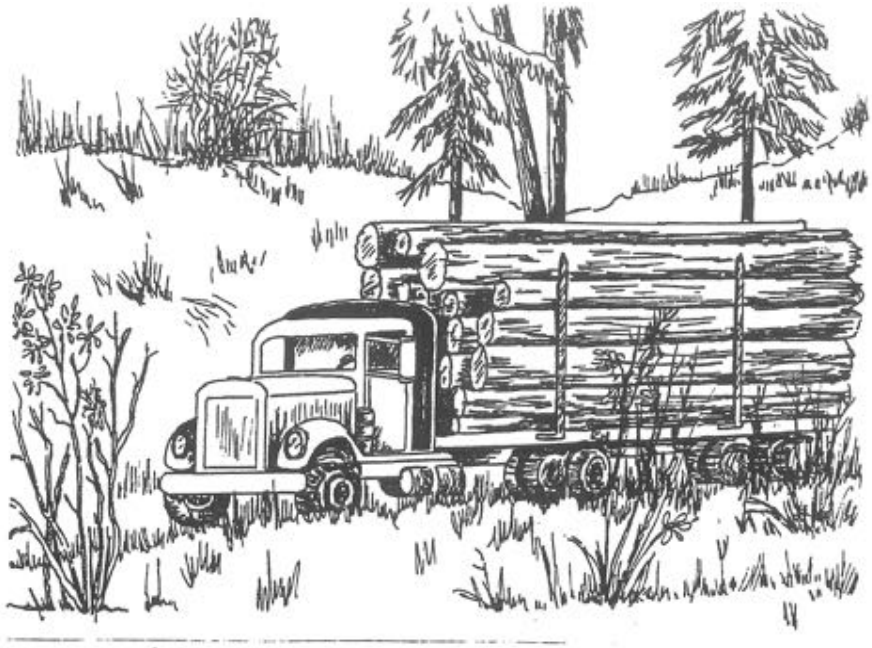
Harris, 1984 believes that "biotic diversity will be maintained on public forest lands only if conservation planning is integrated with development planning; and site-specific protection areas must be designed so they function as an integrated landscape system." Harris, 1984 also states:

> 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 FEIS fails to provide any analysis of this issue whatsoever. For the End Of The World Project, the Overview for Wildlife Specialist Report however, states:

> …clearcut harvests have contributed to forest conditions and landscape patterns that differ from those that would have occurred in the absence of such actions. …Early- and late-successional forest stages have been reduced in extent and diversity of patch size. **Movement corridors and diversity of wildlife cover are less available.** (Emphasis added.)

C. Old Growth and Viability



Logging is the chief systematic pressure affecting old-growth communities.

From USDA Forest Service, 1987d

The Forest Plan methodology for assuring viability for many Sensitive, ESA-listed, and Management Indicator Species (MIS) on the Nez Perce NF is conserving sufficient amounts and distribution of old-growth habitat. We discuss elsewhere in this objection the many deficiencies of the analyses of the topic of old growth for this project.

The Forest Plan Management Area 20 "Description" includes:

> Management Area 20 is equally distributed across the nonclassified portion of the Forest. It is made up of forested lands in timber productivity classes 3, 4, 5, 6, and 7 and occurs on a variety of landtypes. Approximately half of the area has a timber condition class of overmature sawtimber (150 years or older).The remainder of the area is comprised of immature stands (40-80 years) that will provide for replacement old-growth habitat. These lands provide critical habitat for wildlife species dependent on old-growth forest conditions such as the pileated woodpecker, the pine marten, and the fisher.

Management Area 20 Goals include:

> Provide "suitable" habitat (existing and replacement) for old-growth-dependent wildlife species.

Management Area 20 Standards include:

> Schedule no timber harvest in existing old-growth stands until decade 10. Schedule no timber harvest in replacement stands until decade 16.
>
> Select, locate, and administer old-growth areas to protect them from firewood cutting.

Restrict or close all secondary collector and local roads after management activities cease in adjacent areas.

The Forest Plan Management Area 21 “Description” includes:

Management Area 21 consists of timber stands in timber productivity classes 3 and 4 that are old-growth, grand fir-Pacific yew vegetative communities that have been identified as moose winter range. These stands are generally located between the elevations of 4,000 to 6,000 feet on a variety of landtypes. These areas occur across the entire nonclassified portion of the Forest. These areas are key winter habitat for moose.

Management Area 21 Goals include:

Manage the grand fir-Pacific yew plant communities to provide for a continuing presence of Pacific yew “suitable" for moose winter habitat.

The goal for summer elk habitat in this management area is to manage 12,785 acres to achieve at least 75 percent of habitat potential; 31,425 acres to achieve at least 50 percent of habitat potential; and 518 acres to achieve at least 25 percent of habitat potential. Specific methods of how to achieve this will be determined on a site-specific basis during project planning (see Appendix B).

Management Area 21 Standards include:

Close all but specifically-identified roads during the fall and winter.

Restrict range improvements to areas where conifer and Pacific yew regeneration has been established.

The steep lands, greater than 35 percent slope, are "unsuitable" for timber management.

Schedule timber harvest only on the "suitable" lands, less than 35 percent slope, that do not require broadcast slash burning.

For those lands that are scheduled for harvest, harvest a maximum of 5 percent of Pacific yew stand per decade on a 210-year rotation.

Maintain at least 50 percent of the live Pacific yew components scattered throughout the unit in patches 1/4 to 1/2 acre in size.

The preferred harvest type includes patch clearcuts, individual tree selection, group selection, or shelterwood. Patch clearcuts should be no larger than 20 acres in size (5-10 acres preferred).

Maintain leave-strips between yew stands sufficient to provide travel corridors for moose.

Reforest to desired stocking levels either through planting or through natural regeneration to achieve 30 percent crown closure over 20 years for conifers, and 30 percent crown closure over 20-30 years for Pacific yew.

> Meet established fishery/water quality objectives for all prescription watersheds as shown in Appendix A.
>
> Planned ignitions, when within prescription, will be allowed to burn to enhance resource values. Generally, broadcast burning will not be prescribed. Do not slash Pacific yew except to provide room to machine pile. Slash piles should not be placed within patches of yew.

The FEIS fails to demonstrate consistency with the above Forest Plan MA 20 and MA 21 direction.

The FS fails to consider the quality of old growth in terms of Forest Plan Appendix N Standards. These include:

> Where available, stands should be at least 300 acres. Next best would be a core block of 150 acres with the remaining blocks of no less than 50 acres and no more than 1/2 mile away. If existing old-growth blocks are less than 100 acres, the stands between the old-growth blocks should be designated old-growth replacement. The entire unit consisting of old-growth blocks and replacement old growth should be managed as an old-growth complex. If the old-growth component is less than 50 percent of the complex, the complex should be considered replacement old growth. Within the old-growth complex, only the stands that meet old-growth criteria will be counted toward meeting the allocation for existing old growth. The replacement stands will be counted toward meeting the allocation for replacement old growth.
>
> Ideally the perimeter to area ratio of old-growth blocks should be minimized. Linear strips at least 300 feet wide along streams are acceptable if more suitable sites are not available.
>
> Where possible, roads should not be located through or adjacent to old-growth stands in order to reduce human disturbance, loss of snags to firewood cutters, windthrow, and micro-climate changes.
>
> To increase the probability of species immigration and colonization of old-growth islands and to facilitate genetic interchange between isolated population demes, a system of corridors interconnecting old-growth islands is required. Because of Forest direction to manage riparian areas to enhance riparian-dependent species and because the dendritic pattern of stream-side riparian zones readily facilitates connecting old-growth islands, riparian zones will serve as the principal means to provide interconnecting corridors. Corridors should be extensions of closed or nearly closed canopy of forest of sufficient width to resist blow-down.

D. Population trend monitoring is mandatory NPNF Forest Plan viability methodology.
Forest Plan Wildlife and Fish Standard #3 **requires** the FS to:

> Monitor population levels of all Management Indicator Species on the Forest. These include bald eagle, grizzly bear, gray wolf, peregrine falcon, elk, moose, bighorn sheep, pileated woodpecker, goshawk, pine marten, fisher, westslope cutthroat trout, summer

> steelhead, and spring chinook. These species have been selected because (a) they are threatened and endangered; (b) they have special habitat needs that may be influenced significantly by planned management programs; (c) they are commonly hunted, fished, or trapped; (d) they are non-game species of special interest; or (e) their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality.
>
> Population levels will be monitored and evaluated as described in the Forest Plan Monitoring Requirements (Chapter V of the Forest Plan).

Forest Plan Chapter V includes Table V-1 – "Forest Plan Monitoring Requirements." It cites a "NFMA Requirement 36 CFR 219.19(6)" in regards to "Actions, Effects, or Resources to be Measured: Population trends of indicator species—wildlife and fish."

The NPCNF's End Of The World Wildlife Specialists Report acknowledges:

> The National Forest Management Act (NFMA), requires the Forest Service to manage fish and wildlife habitat "to maintain viable populations of existing native and desired non-native vertebrate species in the planning area" (36 CFR 219.19). Management indicator species (MIS) are designated as surrogates for other species with similar life histories or habitat requirements in order to assess the effects of management activities.

36 CFR 219.19, as cited in the Forest Plan, states:

> Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area.

Paragraph 6 as cited in the Monitoring Requirements states, "Population trends of the management indicator species will be monitored and relationships to habitat changes determined."

And specifically for MA 20 and MA 21, the Forest Plan states:

> The monitoring **requirements** from Chapter V that are applicable to Management Area 20 are: 1d, 1e, 1f, 1h, 1i, 1j, 2a, 2d, 2g, 2h, 2i, 2j, 2k, 4, 5, 6, 7, 10, 11. The procedures outlined in Chapter V will be followed to evaluate the data gathered during monitoring.
>
> The monitoring **requirements** from Chapter V that are applicable to Management Area 21 are: 1d, 1e, 1f, 1h, 1i, 1j, 2a, 2d, 2g, 2h, 2i, 2j, 2k, 4, 5, 6, 7, 10, 11. The procedures outlined in Chapter V will be followed to evaluate the data gathered during monitoring.

(Emphases added.) The FS has failed to monitor populations of old-growth MIS and other old-growth associated wildlife. The Committee of Scientists (1999) state:

> Habitat alone cannot be used to predict wildlife populations…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.)

The Committee of Scientists (1999) report stresses the importance of monitoring as a necessary step for the FS's overarching mission of sustainability: "Monitoring is the means to continue to update the baseline information and **to determine the degree of success in achieving ecological sustainability.**" (Emphasis added.) The Committee of Scientists (1999) provide still more emphases on the importance of monitoring:

> The proposal is that the Forest Service monitor those species whose status allows inference to the status of other species, are indicative of the soundness of key ecological processes, or provide insights to the integrity of the overall ecosystem. This procedure is a necessary shortcut because monitoring and managing for all aspects of biodiversity is impossible.
>
> No single species is adequate to assess compliance to biological sustainability at the scale of the national forests. Thus, several species will need to be monitored. The goal is to select a small number of focal species whose individual status and trends will collectively allow an assessment of ecological integrity. That is, the individual species are chosen to provide complementary information and to be responsive to specific conservation issues. Thus, the Committee proposed for consideration a broad list of species categories reflecting the diversity of ecosystems and management issues within the NFS.

E. Forest Plan and Hungry Ridge old-growth direction and analysis are not based upon best available science.

Lesica (1996) believes that the Forest Plan's reliance upon a 10% old-growth Standard could result in extirpation (i.e., loss of viability) of some species. This is based on an estimate of 20-50% of low and many mid-elevation forests being in old-growth condition prior to European settlement.

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.

For the Hungry Ridge analysis, 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, 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." As Forest Plan Appendix N indicates, the Nez Perce NF has one of those Plans with minimum old-growth stand size requirements. Despite that, 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.

The FEIS does not disclose how old the FIA data that 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,

The FEIS does not consider scientific information on the patch size of the old-growth habitat to minimum sizes needed for utilization by old-growth associated wildlife.

The FEIS doesn't disclose how the designated "replacement" old growth was determined to meet Forest Plan criteria. In any case, "replacement old growth" is pretty meaningless. The Forest Plan allows a very liberal interpretation that for such stands, they must be old growth within 100 years but includes no other species habitat component requirements.

Since old growth is below the HRV for the Forest and project area, then viability for old-growth associated species cannot be assured—especially in the context of more proposed logging of mature/old forest and large trees.

USDA Forest Service 1987a considers smaller patches of old growth to be 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 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**. (Bold emphasis added.)

The defining characteristics of old growth are acknowledged by Green et al., 1992:

> 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.

Green et al., 1992 also recognize that "Rates of change in composition and structure are slow relative to younger forests."

In adopting Green et al. 1992 old-growth guidelines, R-1 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's 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 (as set by the Forest Plan Appendix N standard):

> (P)opulations of MIS should not be managed by using minimum habitat standards. MIS standards should take into account the known requirements of old-growth dependent and associated species as well as the enormous gaps in current knowledge of the long-term requirements of these species, and about old-growth ecosystems *per se.*
>
> (A) dangerous tendency of the Forest Service is to manage for habitat minimums, rather than a range about the mean. The use of minimum standards in complex biological systems in general is:
>
> > Likely to create homogenous conditions …rather than a natural mosaic or range of habitats and presumably population conditions. Under the former condition the diversity, resilience and resistance to disturbance of all populations may be compromised …[increasing the potential] for regional extinction.
>
> (USDA Forest Service 1993a).

> (M)inimal area required to sustain a group, minimal age of the trees used, and minimal populations sizes (puts species) at unjustifiable risk, allowing no margin of safety in the event of researcher error, climatic variation, or other factors (Jackson 1986).
>
> Conner (1979) indicates that cavity nesting birds may be threatened by management strategies based on minimums. The pileated woodpecker is of special concern. Most forest woodpeckers probably evolved in a relatively stable environment, in which natural selection favored individuals that use trees closest to the mean size (*id.*). Providing minimum or suboptimal conditions is likely to lead to low nesting success, gradually eliminating such species. (*id.*).
>
> Even if the arithmetic mean of a criteria (such as snag DBH) is used as a management standard, rather than the minimum value for that criteria, the consistent use of habitat components of average measure could pose risk to a species; because with a normal distribution, by definition, approximately one half of the individuals select habitat components larger than the mean. The mean diameter of pileated woodpecker nest trees in northwest Montana is 30 inches DBH (McClelland 1979 and 1989). The standard for "large" snag retention on most Forests in Region 1 is 20 inches DBH minimum. Of 106 pileated woodpecker nest trees, McClelland found only 12 nest trees (11 percent) less than or equal to 20 inches DBH (McClelland 1989). Clearly, a "large" snag standard of 20 inches DBH cannot ensure the long-term viability of pileated woodpeckers that need larger trees for nesting. Similar arguments have been presented for other pileated woodpecker minimum management requirements (*see e.g.,* Caton 1992, Gross 1993) and other old-growth MIS, such as the pine marten and northern goshawk (*see e.g.,* Johnson 1992, Noss 1992, Resources Limited/Five Valleys Audubon Society 1992, Soukkala 1992, Natural Resources Defense Council 1993).

It seems the FS wants to make the definition of old growth to be a simplistic numbers and database analysis game, devoid of biologically vital data gathered in the field which might document what is unique about old growth—not just a few large trees left over after logging, but decadence, rot, snags, down logs, patchy irregular canopy layers—things that can't be created by the agency's version of "restoration" and which would be depleted by such management actions as Hungry Ridge.

The IPNF's 1987 Forest Plan included standards for protection of old growth and associated wildlife (USDA Forest Service 1987c). 1987 Forest Plan Appendix 27 (USDA Forest Service, 1987d) provided other direction and biological information concerning old growth and old-growth associated wildlife species.

Likewise the Kootenai National Forest's 1987 Forest Plan included standards for protection of old growth and associated wildlife, along with Appendix 17 (USDA Forest Service 1987a, USDA Forest Service 1987b).

We incorporate USDA Forest Service, 1987a as well as USDA Forest Service, 1987b which contains a list of "species …(which) find optimum habitat in the "old" successional stage…" We also incorporate Kootenai National Forest, 1991 which 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." USDA Forest Service 1987a, and USDA Forest

Service 1987b also provides biological information concerning old growth and old-growth associated wildlife species.

The NPCNF 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.

The NPCNF has failed to cite any evidence that its managing for old growth habitat (i.e., logging and burning to restore old growth, or to help create old growth) strategy will improve old-growth wildlife species' habitats over the short-term or long-term. In regards to this theory often offered by the FS, 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.** (Pp. 11, 15 emphasis added).

Hutto, et al., 2014 set out to understand the ecological effects of forest restoration treatments on several old-growth forest stands in the Flathead National Forest. They found:

> Relative abundances of only a few bird species changed significantly as a result of restoration treatments, and these changes were characterized largely by **declines in the abundances of a few species associated with more mesic, dense-forest conditions, and not by increases in the abundances of species associated with more xeric, old-growth reference stand conditions.** (Emphasis added.)

The FS ignores scientific information that such active management is the very antithesis of old growth. The FS cites no scientific research or monitoring results which demonstrate management manipulations will create net ecological benefit rather than harm old growth and old-growth associated wildlife.

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[46]). While individual members or old growth associated species may be able to feed or reproduce outside of old growth stands, **biologists are concerned that <u>viable populations</u> 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**

[46] USDA Forest Service 1987b.

> **are genetic reservoirs for some of these species, the value of which has probably yet to be determined.** (Bold emphases added.)

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.

FOC Comment:

> Since the FS assumes that stands 150+ years old have had enough time to develop old growth characteristics, please explain why <u>each 150+ year old stand</u> proposed for treatment is deficient in specific Forest Plan or Green et al. old growth criteria. In other words, please disclose what <u>each 150+ year stand</u> proposed for treatment <u>lacks</u> in terms of the old growth characteristics. (Please note that "too many trees" is not an old growth disqualifier.)

FS response: none.

FOC Comment:

> "Replacement old growth will generally be immature stands that are naturally changing to desirable characteristics of old, decadent forest." What are the metrics used to determine that a stand is "naturally changing to desirable characteristics of old, decadent forest"? How is this documented? Are <u>all stands proposed for logging</u> compared to the "replacement old growth" criteria?

FS response: none.

FOC Comment request, "Please disclose the natural historic range vs. current conditions regarding patch size, edge effect, and amount of interior forest old growth in the project area and forestwide" was ignored.

FOC Comment:

> How well do each of the various categories of old growth stands (MA 20, replacement old growth, NIOG (Green et al.) old growth, Forest Plan old growth) in the project area correlate with the DEIS's largest Tree Size class (>20 dbh)?

FS response: none.

FOC Comment: "(I)f the FS were to monitor (measure) forest characteristics of this post-logging old growth to verify its claims that old growth would be improved or maintained, what specific old-growth habitat components would be measured?

FS response: none.

FOC Comment: "'Proposed activities would also allow low elevation old growth communities to function as they once did **under a natural fire regime**…' (Emphasis added.) Given that all-out fire suppression would continue regardless of the alternative selected, this statement makes no sense." FS response: none

FOC Comment:

> Because it takes "up to 150 years …for stands to develop into a mature or older condition and snags to develop into a condition that provides habitat for species that prefer older forest conditions" the FS expand the temporal cumulative effects analysis for wildlife species to extend both backward and forward in time for at least 150 years.

FS response: "…existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects."

FOC Comment:

> 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." The DEIS does not disclose the amount of error either in field data or the error inherent in using modeled vegetation layers for assessing wildlife habitat.

FS response: "The wildlife specialist report includes confidence intervals for vegetation data (VMap) used to model wildlife habitat." This does not provide a comprehensive answer.

FOC Comment: "The DEIS doesn't explain why the FS believes the fisher population remains at a low level in the Clearwater drainage." FS response: "The DEIS does not state fisher populations are at a low level in the Clearwater drainage. Please see the wildlife specialist report for a discussion of the current conditions for fisher." The wildlife specialist report has no discussion of fisher populations in the Clearwater drainage, but the NPCNF's Clear Creek FEIS states: "Fishers are distributed throughout most of their historical territory in the Clearwater drainage, although **the population remains at a low level**." Is that FEIS wrong?

<u>Remedy:</u> Select the No Action alternative. Alternatively, prepare an EIS that addresses the analytical and scientific issues identified above.

Gautreaux, 1999. Vegetation Response Unit Characterizations and Target Landscape Prescriptions, Kootenai National Forest, 1999. United States Department of Agriculture Forest Service, Northern Region, Kootenai National Forest.

WILDLIFE

Our comments on the DEIS discussed wildlife issues (pages 21-32).

The Wildlife Specialist Report states, "The effects to wildlife species and habitat is primarily measured by the amount of habitat affected and the degree of effects to threatened, endangered, sensitive, and management indicator species."

The Hungry Ridge wildlife analyses:

- Rely upon overly narrow definitions of suitable habitat, while providing no indication of the reliability of the data, and no indication of the validity of suitable habitat modeling.
- Fail to explain how the suitable habitat definitions fit with the biological needs of species so that "suitable habitat" amounts and distribution sustain viable populations.
- Fail to utilize best available science in adopting conservation strategies.
- Fail to describe the quantity and quality of habitat that is necessary to sustain viability.
- Don't translate to analysis or comparison of alternatives in the FEIS.
- Fail to consider cumulative impacts of past management actions in a logical cumulative effects analysis area.
- Fails to consider cumulative impacts of management actions following from the Doc Denny and End Of The World projects which are adjacent to/contiguous with the Hungry Ridge project area.
- Conflate old growth with Management Area 20, which the FS admits is not the same thing.

The FEIS discloses that "Past timber harvest records date to 1960. There are a total of 28 timber sales with harvest units from 1960 through the 2000s. The total area harvested from 1960 to the present (2016) was 8,567 acres, with a peak of acres harvested in the 1980s. Refer to Appendix C and the project record for a list of the timber sales by decade and acres harvested." However, the FEIS doesn't disclose how the past logging—which affected close to 30% of the project area acreage—might have adversely affected wildlife.

FOC comments requested the FS "explain how management and other human activities have affected the abundance and connectivity of habitats and abundance of populations and population trends of the marten, fisher, northern goshawk, flammulated owl, white-headed woodpecker, pygmy nuthatch, and pileated woodpecker." The FS responded:

> In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, the analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

In other words, the FS claims that compliance with NEPA only involves a description of the current conditions, and no analysis of effects from past management is needed. However that is only donning blinders to the effects of past actions. While providing no discussion on past abundance and distribution of wildlife, the FS pretends it's not relevant.

The FEIS discloses:

> …clearcut harvests have contributed to forest conditions and landscape patterns that differ from those that would have occurred in the absence of such actions. Past regeneration

> harvest units typically contain **few large snags and lower amounts of coarse woody debris** than untreated areas. (Emphasis added.)

The Wildlife Report states, "Most of the new harvest units are adjacent to previous harvest units creating extremely large forest openings over several hundred acres in size, which are devoid of standing snags and down wood."

Despite the above emphasized acknowledgement, there is no analysis as to how those areas are currently and foreseeably affecting population numbers and distribution of any native wildlife.

The FS isn't saying how much of the already depleted large dead wood—standing or on the ground—would be lost due to safety or to meet "fuel reduction" goals as part of routine project actions.

The Wildlife Specialist Report states:

> Habitat relationships were used to model available habitat in and near the project area. The models used are based on existing vegetation, as modified from recent vegetation management projects, using the Region 1 VMap database (2014) and in some cases NLCD Data for the Hungry Ridge project area. … A 2015 accuracy assessment of VMap derived Lifeform, Tree Canopy Cover, Dominance Type (DOM_40), and Tree Size for the Nez Perce-Clearwater National Forest yielded 91%, 88%, 84%, and 99% overall accuracy respectively (Brown 2015).

However Brown, 2015 states "the 99% overall accuracy estimated for the Tree Size class is questionable and is likely attributed to the amount of manual editing that went into the Tree Size map." Also:

> The take home message is that even the accuracy assessment, which is judged as "truth" because there has to be some standard by which to compare the map, needs to be taken with a grain of salt. While the accuracy assessment is an attempt at a numerical quantification of the error structure in the map products, this is no substitute for a qualitative map evaluation prior to it's use in any analysis. Both the "good" and the "bad" performances noted within the error matrices should be mitigated by a solid qualitative evaluation of the map products based on the User's understanding of the vegetation classification system and in-depth knowledge of the on the ground conditions. (Id.)

Bottom line—the FS's use of VMAP needs validation for analyzing impacts on wildlife habitat in projects such as Hungry Ridge, which is entirely lacking.

<u>Canada Lynx</u>

The U.S. Fish & Wildlife Service (FWS) listed the Canada lynx as a threatened species under the Endangered Species Act (ESA) in 2000 due to "lack of guidance for conservation of lynx and snowshoe hare habitat..." and subsequent authorization of actions that may cumulatively adversely affect the lynx.

The FEIS doesn't even state if this Threatened native species is found in the project area, or if surveys have been conducted. The FEIS states, "Nez Perce National Forest is considered unoccupied, secondary habitat (Northern Rockies Lynx Amendment 2007)." The FEIS states the Hungry Ridge project "is located within one lynx analysis unit (LAU3050602)."

The Proposed Action for the nearby End Of The World project acknowledges "There have been two documented sightings within the project area near Goodwin Meadow (2002) and Schwartz Meadow (2001) along the Grangeville Salmon Road."

The Wildlife Report states, "Lynx, if present, are potentially transient animals traversing across the forest, thus no long-term impacts to individual lynx and their habitat are anticipated." The report also states: "The Hungry Ridge Project is consistent with the standards and guidelines in the Northern Rockies Lynx Management Direction. There appears to be little risk to lynx populations on the Nez Perce National Forest resulting from implementation of the Hungry Ridge project. The actions taken in the project are fully compatible with recovering lynx and consistent with maintaining habitat." Still, the FS hedges with the concession that the project "may affect" Canada Lynx. The FS can't explain why the FS believes a species native to the ecosystem, with documented occurrence near the project area, should merely be considered a "transient" that isn't really "occupying" the places it happens to be found.

A big problem with the Forest Plan, including the Northern Rockies Lynx Management Direction (NRLMD) is that it allows with few exceptions the same level of industrial forest management activities that occurred prior to Canada lynx listing under the ESA. The FS approval and implementation of the NRLMD is arbitrary and capricious, violates NEPA's hard look requirement and scientific integrity mandate and fails to apply the best available science necessary to conserve lynx. For example, the NRLMD contains no protection or standard for conservation of winter lynx habitat (old growth forests).

The FEIS doesn't disclose if snowshoe hare occurrence is documented determined in project area forest considered unsuitable for lynx. And the FEIS doesn't disclose if surveys of Canada lynx "unsuitable" habitat in the project area were conducted to find out if such habitat might in fact meet the FS definition of suitable after all. More often than not, when the FS conducts logging projects in Lynx Analysis Units (LAUs), surveys of stands for lynx habitat result in less suitable habitat than previously assumed. The FS needs to step back and consider the likelihood that its range-wide Canada lynx suitable habitat estimations and assumptions for the NRLMD are too high.

Best available science demonstrates that lynx travel between areas of high hare densities but tend to avoid low cover areas in winter.

The Montana Federal District Court ruled on 10/15/2018 that the FS must complete forest-wide consultation with the FWS to determine effects Forest Plans may have on lynx.

The FEIS doesn't analyze and disclose cumulative impacts of recreational activities on lynx, such as snowmobiles. As the Kootenai NF's Galton FEIS states, "The temporal occurrence of forest uses such … winter (skiing and snowmobiling) … may result in a temporary displacement of lynx use of that area…"

The FEIS doesn't analyze and disclose the cumulative effects on Canada lynx from trapping or from use of the road and trail networks in the project area. The FEIS states, "Road construction has impacted wildlife security, making …lynx …more vulnerable to hunting and trapping mortality. Additionally, the wide-spread availability and use of off-road vehicles has resulted in a reduction in wildlife security.

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 Feg. Reg. at 8617. The contiguous United States is at the southern edge of the boreal forest range, resulting in limited and patchy forests that can support snowshoe hare and lynx populations.

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.

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. The importance of maintaining lynx linkage zones is also recognized by the FS's Lynx Conservation Assessment and Strategy (LCAS) which stresses that landscape connectivity should be maintained to allow for movement and dispersal of lynx.

Squires et al. (2013) noted in their research report that some lynx avoided crossing highways; in their own report, they noted that only 12 of 44 radio-tagged lynx with home ranges including 2-lane highways crossed them.

The current best science indicates that lynx winter foraging habitat is critical to lynx persistence (Squires et al. 2010), and that this habitat should be "abundant and well-distributed across lynx habitat." (Squires et al. 2010; Squires 2009.) Existing clearcuts not yet recovered are likely to be avoided by lynx in the winter. (Squires et al. 2010; Squires et al. 2006a.)

Lynx winter habitat, provided only in older, multi-storied forests, is critical for lynx preservation. (Squires et al. 2010.) Winter is the most limiting season for lynx in terms of resource use; starvation mortality has been found to be the most common during winter and early spring. (Squires et al. 2010.) Prey availability for lynx is highest in the summer. (Squires et al. 2013.)

Openings, whether in uneven-aged management such as the proposed "variable density thinning" or with the proposed "regeneration" (aka clearcut or modified clearcut) logging, remove lynx winter travel habitat on those affected acres, since lynx avoid such openings. (Squires et al. 2010.)

Squires et al., 2010 reported that lynx winter habitat should be "abundant and spatially well-distributed across the landscape." Those authors also note that in heavily managed landscapes, retention and recruitment of lynx habitat should be a priority.

The LCAS (Ruediger et al. 2000) recommends agencies retain future options until conclusive information is developed concerning lynx management; that is, err on the side of maintaining and restoring habitat for lynx and their prey. To err on the side of caution, the FS would retain all remaining stem exclusion forests for recruitment into lynx winter habitat, so that this key habitat would more closely resemble historic conditions.

The LCAS notes that lynx seem to 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. Squires et al. 2010 again reported that lynx avoid crossing clearcuts in the winter; they generally avoid forests composed of small diameter saplings in the winter; and forests that were mechanically thinned were generally avoided in the winter.

Squires et al. 2010 show that the average width of openings crossed by lynx in the winter was 383 feet, while the maximum width of crossed openings was 1240 feet.

And scientific findings since the Forest Plans were amended by the NRLMD call into question much Forest Plan/NRLMD direction. This creates a scientific controversy the FS fails to resolve, and in fact it essentially ignores it.

For one, 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 agency's assumption in the Forest Plan/NRLMD 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.

Also, the Forest Plan essentially assumes that persistent effects of vegetation manipulations other than regeneration logging and some intermediate treatments are essentially nil. However, 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 contradicts Forest Plan assumptions that clearcuts can be considered useful lynx habitat as early as 20 years post-logging.

Results of a study by Vanbianchi et al., 2017 also conflict with Forest Plan/NRLMD assumptions: "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." The NRLMD erroneously assumes clearcutting/regeneration logging have basically the same temporal effects as stand-replacing fire as far as lynx re-occupancy.

Kosterman, 2014, Vanbianchi et al., 2017 and Holbrook, et al., 2018 demonstrate that Forest Plan direction is not adequate for lynx viability and recovery.

Grizzly Bear

Since there is solid documentation of recent and ongoing grizzly bear occupancy in the Bitterroot National Forest[47], and with recent documented sightings on the Clearwater NF, grizzly bear residency in the NPCNF should be considered permanent. Formal consultation on the Forest Plans are 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

[47] 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).

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.[48] 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.

Fisher

The FEIS states, "Fisher are known to occur on the Nez Perce-Clearwater National Forests. Based on wildlife surveys conducted in 2013 and 2014, fisher are known to occur in the project area." The Wildlife Report states, "Fisher use of the project area, in particular riparian zones, is likely." Also, "One of the (hair snare survey) samples collected adjacent to the project area tested positive for fisher. Six incidental observations of fisher have been recorded within the project area since 1990 and a remote camera took a picture of a fisher within the project area in 2014." Also, the End Of The World Proposed Action states, "There have been …observations of fisher within the project area …in the southeastern portion of the project area in the upper portions of the South Fork of White Bird Creek subwatershed."

Jones and Garton, 1994 found that 54% of fisher use during the winter was in mature/old growth forest. More recently, scientific literature (Aubry et al. 2013, Olsen et al. 2014, Raley et al. 2012, Sauder 2014, Sauder and Rachlow 2014, Schwartz et al. 2013, Weir and Corbould 2010) suggest that fishers are heavily associated with older forests throughout the year.

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).

Most studies have found that fishers are reluctant to stray from forest cover and that they prefer more mesic forests (Olson et al. 2014, Schwartz et al. 2013, 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).

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

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[48] 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.

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).

This species needs large areas for recovery and most of the preferred habitat on the Nez Perce Clearwater National Forest that is preferred by this species has been target of historical and proposed timber management activities (Nez Perce Clearwater Forest Plan Revision Proposed Action). Sauder (2014) accurately portrays his concerns with this statement: "Although these figures represent relatively large areas, taken in the context of the large forested landscapes that individual fishers require (male and female home ranges average 98.4 km^2 and 49.3 km^2, respectively; Sauder and Rachlow 2014), this does not constitute a surplus of habitat". Looking at potential population numbers it is a little easier to understand, why the species has been extirpated across much of its range. The literature (Sauder 2014) suggests that roadless areas will not be the salvation for this species, and that management guidelines are sorely needed in areas like the EOTW project area, in order to assure species viability.

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. These Forests along with the St. Joe National Forest (Number 6 on the list) are currently being managed as three Forests (Nez Perce/Clearwater, Idaho Panhandle and the Kootenai). They include the Forests with the highest historical and proposed timber cuts in the Region and most of the existing and proposed harvest is scheduled in habitats preferred by fishers. On the Nez Perce-Clearwater Forests this area has been termed the "Front Country" and several large projects have been proposed for these areas (Slate Creek, Clear Creek, Lolo Creek, Orogande, French Larch, Johnson Bar, End Of The World, Doc Denny, etc.). The Nez Perce-Clearwater Forests have no idea on what the cumulative impact of all this activity will be on fishers.

As with most of the Sensitive wildlife, the FES fails to disclose the direct, indirect and cumulative impacts on important habitat components such as snags, logs, foraging habitat configuration, connectivity, cover, and impacts on predator and prey species.

The FEIS fails to include a quantitative cumulative effects analysis for fisher considering trapping and use of the road and trail networks in the project area. Hayes and Lewis, 2006 state "The two most significant causes of the fisher's decline were over-trapping by commercial trappers and loss and fragmentation of low to mid-elevation late-successional forests." Hayes and Lewis, 2006 also present a science synthesis in the context of a recovery plan for fisher in the state of Washington. Hayes and Lewis, 2006 state:

> Trapping reduced populations quickly. Despite decades of protection from harvest, fisher populations never recovered in Washington. Fishers use forest structures associated with late-successional forests, such as large live trees, snags and logs, for giving birth and raising their young, as well as for rest sites. Travel among den sites, rest sites, and foraging areas occurs under a dense forest canopy; large openings in the forest are avoided. Commercial forestry removed the large trees, snags and logs that were important habitat features for fishers, and short harvest rotations (40-60 years) didn't allow for the replacement of these large tree structures. Clearcuts fragmented remaining fisher habitat

> and created impediments to dispersal, thus isolating fishers into smaller populations that increased their risk of extinction.

The FEIS also fails to disclose the direct, indirect or cumulative impacts on important habitat components, such as snags, logs, foraging habitat configuration, connectivity, cover, prey species impacts, etc.

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).

Ruggiero et al. 1994b state, "(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 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).

Also Jones, (undated) recognizes:

> 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 state:

> 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.

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)." The FS's silvicultural focus would reduce grand fir, a fact which is not reconciled in the analysis.

<u>Northern Goshawk</u>

The FEIS states:

> Goshawks are known to occur on the Nez Perce-Clearwater National Forest. As a result of surveys conducted for goshawks in 2013, 2014, 2015, and 2016, three goshawk territories have been identified within the Hungry Ridge project area.

The FEIS doesn't disclose the goshawk survey methodology, to compare it 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.)

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 post-fledging areas (PFA)s 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. Reynolds et al. 1992 recommendations can easily be interpreted as retaining at least 20% old growth per territory.

Reynolds et al. 1992 state, "forests in the PFAs should contain overstories with canopy cover 50% and greater and well-developed understories and habitat elements critical (e.g., snags, nest trees, foods) in the life-histories of goshawk prey species."

It is not clear if all the nesting stands to be retained for the goshawk are embedded within the PFA, as is required as per Reynolds et al. 1992.

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.

According to Clough 2000, it would seem that a process into climax conditions would benefit three key goshawk prey species: the red squirrel, the snowshoe hare, and various woodpeckers. Logging will eliminate/reduce two key goshawk prey species, the red squirrel through commercial thinning and regeneration harvests, and the snowshoe hare through understory thinning and regeneration harvests.

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)…."

Moser (2007) and Moser and Garton (2009) reported the mean home range size of male goshawks (N=7) was 12,710 acres and female goshawks (N=12) was 9,532 acres in Northern Idaho. Studies in other areas have reported smaller home range sizes in the neighborhood of 5,000-6,000 acres (Reynolds et al. 1992). Moser's larger home range sizes may be related to the fact that Moser's study was conducted in an industrial forest landscape with a large amount of timber harvest. Other factors may be differences in methodology, use of satellite technology by Moser (2007) or differences prey availability in Northern Idaho.

Moser reported that, home range size was largely related to nesting success and the amount of openings and mature forest within the home range. Birds of both sexes with successful nests generally had smaller home ranges. For example, males with successful nests (N=4) had an average home range size of 9,657 acres and females with successful nests (N=8) had an average home range size of 6,600 acres. Male bird home range size increased as the number of openings in the home range increased and the amount of closed canopy forest decreased, but these factors weren't significant for female birds.

The Wildlife Report states, "Based on a study in northern Idaho (Moser 2007, pg. 18), it was determined that timber harvest activity within a nest area did not appear to affect goshawks until the nesting habitat in the territory fell below 39%." This is actually a misrepresentation of Moser's study results. Moser, 2007 does state, "Classification trees showed that timber harvest did **not affect goshawk *nesting attempts*** as long as the 170-ha area surrounding the nest contained at least 39% potential nesting habitat following harvest. In the short term, goshawks are **more likely to *attempt nesting*** in territories after disturbance if >39% of their territory is left in potential nesting habitat." (Emphases added.) He also states:

> Although the classification tree suggested a threshold of 39% for potential nesting habitat within the nesting territory, the mean amount of potential habitat remaining was actually around 57-58% for reoccupied territories, indicating goshawks may prefer to reoccupy territories with higher amounts of nesting habitat than suggested by the classification tree.

Moser's study was limited to two years post-logging, and he states, "What is unknown is whether there will be delayed responses in prey availability, competition, or predation as a result of habitat modification."

In short, the Wildlife Report's assumption that the Moser study determines that limiting modification of nesting stands to 39% or less results in no effects is a strained interpretation, considering other contradicting scientific information.

The Wildlife Report also states, "Approximately 32-34% of the nesting habitat would be reduced with timber harvest as the canopy cover and amount of trees remaining would be below what goshawks would use for nesting." The problem with the wildlife biologist's analysis is that it fails to utilize any given nest stand as the analysis area, simplifying the analysis by using total project area nesting habitat, and ignoring best available science strongly suggesting minimizing disturbance in nest stands. 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.

It is not clear if all the nesting stands to be retained for the goshawk are embedded within the PFA, as is required as per Reynolds et al. 1992.

The FEIS specifies "Maintain a minimum 40 acre yearlong no-treatment buffer (no ground disturbing activities) around recently occupied goshawk nest trees…" Yet as we state above, the FS's survey methodology would easily allow existing nesting goshawks to slip between the cracks in this mitigation measure.

The Wildlife Report states, "One of the primary benefits, particularly in the dense, mid-aged stands typical of the analysis area, is decreased density of trees in the understory (Kennedy 2003). An open understory facilitates prey identification and capture because goshawks hunt primarily by sight (Reynolds et al. 1992)." However, in the Clough, 2000 study in Montana, the snowshoe hare was one of two most important goshawk prey species. The snowshoe hare is associated with dense understories.

The FS's Samson (2006) reports says that 110 breeding individuals (i.e. 55 pairs) are necessary for a viable goshawk population in R1. USDA Forest Service, 2005e is a map showing the results from the 2005 R1 region-wide goshawk survey using the FS's Woodbridge and Hargis goshawk monitoring protocol. That 2005 detection map says there were 40 detections in 2005 in Region 1. So the results of this survey essentially show that the population in Region 1 has not been viable according to the agency's own science (only 40 instead of 55). And some of the detections may have been individuals using the same nest, so the number of nests (and therefore number of breeding pairs) could be even lower than 40.

Also please consider Beier and Drennan, 1997; Greenwald et al., 2005; La Sorte, et al., 2004 and Patla, 1997 as best available science for northern goshawk biology.

Black-Backed Woodpecker

The FEIS doesn't state if this Sensitive native species is found in the project area, or if surveys have been conducted. The Wildlife Report acknowledges "Black-backed woodpeckers are known to occur on the Salmon River District in both fire created and insect infested habitats."

FOC comments stated:

> "At the expense of providing for a more healthy forest, foraging resources (for black-backed woodpecker) would be substantially reduced." This reveals a big problem with the FS's definition of a healthy forest, which is a tree farm that grows trees quickly for lumber, with little regard for wildlife.

The FS did not respond to that comment.

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.

The FEIS doesn't disclose the FS's strategy and best available science for insuring viable populations of the black-backed woodpecker.

Current forest management policies serious implications for the black-backed woodpecker. Forestwide suppression of habitat conditions would eliminate population viability. The Wildlife Specialist Report for the nearby 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 FEIS and Hungry Ridge Wildlife Report and other analyses fail to <u>quantify</u> 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 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.

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 FEIS'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.

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).

Pileated Woodpecker

The Wildlife Report states, "Pileated woodpeckers were evident and documented in the project area during project field review."

The proposed logging would impact forest that provides habitat for species needing the kind of habitat features found in mature and old-growth forests, such as the pileated woodpecker.

The Wildlife Report states, "Through their selection of large dead and damaged trees, pileated woodpeckers may serve as a good indicator of ecological function rather than just the age of a stand or forest (Bonar 2001)." Similarly, the Committee of Scientists, 1999 define "Keystone species "as a:

> …species whose effects on one or more critical ecological processes or on biological diversity are much greater than would be predicted from their abundance or biomass (e.g., the red-cockaded woodpecker creates cavities in living trees that provide shelter for 23 other species).

Consistent with the notion of the pileated woodpecker as a keystone species, USDA Forest Service 2011c states:

> Many types of disturbances, such as timber harvest, fuel reduction, road construction, blow-down, wildland fire, or insect or disease outbreaks, can affect old growth habitat and old growth associated species. This is well illustrated by **the pileated woodpecker, a "keystone" species**, which provides second-hand nesting structures for numerous old growth species such as boreal owls, kestrels, and flying squirrels (McClelland and McClelland 1999, Aubry and Raley 2002). A disturbance can reduce living tree canopy cover to levels below that needed by the pileated woodpecker's main food source, carpenter ants, forcing the pileated to forage and possibly nest elsewhere. Carpenter ants, which live

> mostly in standing and downed dead wood, can drastically reduce populations of species such as spruce budworm (Torgersen 1996), the most widely distributed and destructive defoliator of coniferous forests in Western North America. (Emphasis added.)

The FEIS fails to disclose the FS's strategy and best available science for insuring 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 the latest information on such effects.

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. Bull and Holthausen (1993) recommend that approximately 25% of the home range be old growth and 50% be mature forest. They suggested that 50% of the area should have stands with greater than 60% canopy closure and at least 40% should remain unlogged (any type of logging). Follow up work (Bull et al. 2007) found that bird density did not change in 30 years (despite major infestations of spruce budworm) in home ranges meeting these guidelines, unless extensive regeneration harvesting had occurred in the home range. 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.

Long-term studies (Bull et al. 2007) suggest that the pileated woodpecker is highly sensitive to both regeneration harvest and other activities like commercial thinning and improvement harvest. Fuel treatments on the Starkey Experimental Forest which were similar to activities proposed in EOTW, where shown to reduce reproductive success for pileated woodpeckers significantly (Id.).

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

This preferred diameter of nesting trees for the pileated woodpecker recognized by R-1 is notable. USDA Forest Service, 1990 uses an index of the "Number of potential nesting trees >30" dbh per acre" for the pileated woodpecker, and McClelland and McClelland (1999) found 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 rather large diameter is not adequately considered in the Forest Plan. Project specifications provide vague and inadequate commitments for leaving specific numbers and sizes of largest trees favored by the pileated woodpecker and thus so many other wildlife species.

The Wildlife Specialist Report states, “There are about 1407 acres of nesting habitat with average tree size greater than 20 inches dbh and canopy cover >60% in mixed conifer habitat (ponderosa pine, Douglas-fir, grand fir, and western red cedar) (Bull et al. 1986).” But this means the FS is claiming 21” dbh for nesting pileated woodpeckers is adequate, which conflicts with the Region 1’s own science (and other science we cite above) which highlights the necessity for considering trees closer to 30” dbh for nesting. The FS’s problem with the pileated woodpecker is—they have no database entry for trees that large.

As a result of this analysis obfuscation, the FS doesn’t determine how much pileated nesting habitat would be destroyed by the timber sale.

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).”

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

B.R. McClelland has extensively studied the pileated woodpecker habitat needs. McClelland, 1985 (a letter to the Flathead NF forest supervisor) 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 minimum 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 old/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.

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 primary cavity excavators themselves, such as the pileated woodpecker, are able 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. The FS and Forest Plan fails to recognize this scientific finding. Lorenz et al., 2015 must be considered best available science to replace inadequate forest plan direction for snag retention.

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. The 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."

The FEIS fails to provide a quantitative analysis of the cumulative snag loss in areas previously logged areas, or other sites (such as roadside) subject to other causes of snag loss.

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."

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 due to human influence (Wisdom et al. 2000). And Bate and Wisdom, 2004 investigated management and other human influences on snag abundance. Some findings include:

> 1. Stands far from roads had almost three times the density of snags as stands adjacent to open or closed roads. No difference in snag density existed for stands adjacent to open versus closed roads. Rather, snag density declined with increasing proximity to nearest road. Consequently, the presence of any road near or adjacent to a stand is an important predictor of substantially reduced density of snags. Ease of access for firewood cutting and other forms of timber harvest is the most likely explanation for reduced snag density near roads.
>
> 2. Stands closer to the nearest town had a lower density of snags than those farther from nearest town. This finding implies that stands closer to town, and therefore more accessible

to human activities, also are likely areas where firewood cutting is concentrated, resulting in reduced snag density.

3. Stands in the late-seral stage had three times the density of snags as stands in the mid-seral stage, and almost nine times that of stands in the early-seral stage. Stands in the late-seral stage provide essential snag habitat for wildlife that does not appear to be consistently present in younger stands.

4. Stands with no history of timber harvest had three times the density of snags as stands that were selectively harvested, and 19 times the density as that in stands that had undergone a complete harvest. These results suggest that past timber harvest practices have substantially reduced the density of snags, and that snag losses have not been effectively mitigated under past management.

5. Stands adjacent to private land had a lower density of snags within mid- and late-seral stages, in contrast to a higher density in stands surrounded by Forest Service land. These results are likely explained by safety and fire management policies, which call for removal of snags along property boundaries, where such snags often are deemed to pose safety or fire hazards. In addition, increased human access likely contributes to lower snag densities in stands adjacent to private land.

The FEIS fails to estimate quantitative snag loss expected because of safety concerns during project activities, and also from both the proposed methods of prescribed burning and log removal.

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 FEIS doesn't disclose how statistically robust the project area surveys are for making accurate estimates and analyses.

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.

Pine Marten

The pine marten is an MIS under the Forest Plan. FOC comments stated, "The DEIS doesn't explain why …pine marten are not found in the project area." The FS responded that no explanation is needed.

The Wildlife Report indicates few marten have been noted in the project area recently: "There have been hair snare surveys for mustelids conducted within the project area as part of these larger Forest-wide efforts. Ten hair snare sample locations fall within or adjacent to the project area in 2007 resulting in a single documented marten genetic sample. An additional 4 snare sample locations were established within the project area as part of survey efforts in 2013. None of the 2013 hair snares produced marten genetic samples. One incidental observation of marten tracks was recorded within the project area in 1991."

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

Numerous recent studies have found that the species is particularly vulnerable to habitat fragmentation (Webb and Boyce 2009, Hargis et al. 1999, Moriarty et al. 2011, Potvin et al. 2000). For example, Hargis et al. (1999) reported that "Martens were nearly absent from landscapes having >25% non-forest cover, even though forest connectivity was still present." Effects seem to be more pronounced in western conifer forests like the project area.

Marten avoidance of openings is well documented in the literature (Potvin et al. 2000, Koehler and Hornocker 1977, Chapin et al. 1998).

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.

Home range estimates are highly variable for marten (Burskirk and McDonald 1989, Powell 1994) and no good estimates are available for Idaho in the literature. We suggest using the findings of Bull and Heater (2001) who found that female home ranges averaged 3,500 acres in nearby Northeastern Oregon. They report that home ranges do not overlap significantly in the same sex, but larger male home ranges (6,700 acres) often overlap female home ranges.

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 Wildlife Report states, "Across the project area, open roads to motorized vehicles facilitate access for trappers and firewood cutters, potentially decreasing marten populations and the downed logs important for marten and their prey species." However, this projected population reduction is not quantified—directly, indirectly, or cumulatively.

<u>Wolverine</u>
The Wildlife Report states, "In reviewing Inman's 2013 model for primary and maternal wolverine habitat, there is no wolverine habitat within the Hungry Ridge project area. Known occurrences and suitable habitat exist within the Gospel-Hump Wilderness, adjacent to the project area." Since the wolverines residing in the Gospel-Hump Wilderness depend upon connectivity to other wolverines beyond the Wilderness to comprise a population of sufficient size to be viable, the Hungry Ridge project area must be assumed to be occupied. There is no viability analysis for NPCNF wolverines cited in the FEIS.

The wolverine is proposed for listing as a threatened species under the ESA. The proposed rule was issued in 2013. 78 Fed. Reg. 7864 (February 4, 2013). FWS withdrew the rule on August 13, 2014, and the withdrawal of the rule was deemed unlawful and vacated in 2016. *Defenders of Wildlife v. Jewell*, 176 F.Supp.3d 975 (D. Mont. 2016). Thus, the wolverine is currently proposed for listing under the ESA.1 81 Fed. Reg. 71670 (October 18, 2016). The FS must undergo formal consultation with the U.S. Fish & Wildlife Service.

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.

Wolverines use habitats 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.”

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.”

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).

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.

In regards to the 2013 memo from the Regional Office (USDA Forest Service, 2013c), we see that district-level specialists are not allowed to arrive at effects conclusions based upon their own expertise and judgment.

Western (Boreal) Toad

The Wildlife Report states, "There are no recent documented sightings of this species within the project area. Based on habitat availability, it is likely that low levels of use are occurring, although site-specific surveys have not been conducted."

USDA Forest Service, 2003a states:

> Little quantitative data are available regarding the boreal toad's use of upland and forested habitats. However, boreal toads are known to migrate between the aquatic breeding and terrestrial nonbreeding habitats (TNC Database 1999), and that juvenile and adult toads are capable of moving over 5 km between breeding sites (Corn et al. 1998). It is thought than juveniles and female boreal toads travel farther than the males (Ibid). A study on the Targhee National Forest (Bartelt and Peterson 1994) found female toads traveled up to 2.5 kilometers away from water after breeding, and in foraging areas, the movements of toads were significantly influenced by the distribution of shrub cover. Their data suggests that toads may have avoided macro-habitats with little or no canopy and shrub cover (such as clearcuts). Underground burrows in winter and debris were important components of toad selected micro-sites in a variety of macro-habitats. The boreal toad digs its own burrow in loose soil or uses those of small mammals, or shelters under logs or rocks, suggesting the importance of coarse woody debris on the forest floor. …(T)imber harvest and prescribed burning activities could impact upland habitat by removing shrub cover, down woody material, and/or through compaction of soil.

Montana Fish, Wildlife & Parks, 2005 (a more recent version of the above cite "TNC Database, 1999") also discuss boreal toad habitat:

> Habitats used by boreal toads in Montana are similar to those reported for other regions, and include low elevation beaver ponds, reservoirs, streams, marshes, lake shores, potholes, wet meadows, and marshes, to high elevation ponds, fens, and tarns at or near treeline (Rodgers and Jellison 1942, Brunson and Demaree 1951, Miller 1978, Marnell 1997, Werner et al. 1998, Boundy 2001). Forest cover in or near encounter sites is often unreported, but toads have been noted in open-canopy ponderosa pine woodlands and closed-canopy dry conifer forest in Sanders County (Boundy 2001), willow wetland

thickets and aspen stands bordering Engelmann spruce stands in Beaverhead County (Jean et al. 2002), and mixed ponderosa pine/cottonwood/willow sites or Douglas-fir/ponderosa pine forest in Ravalli and Missoula counties (P. Hendricks personal observation).

Elsewhere the boreal toad is known to utilize a wide variety of habitats, including desert springs and streams, meadows and woodlands, mountain wetlands, beaver ponds, marshes, ditches, and backwater channels of rivers where they prefer shallow areas with mud bottoms (Nussbaum et al. 1983, Baxter and Stone 1985, Russell and Bauer 1993, Koch and Peterson 1995, Hammerson 1999). Forest cover around occupied montane wetlands may include aspen, Douglas-fir, lodgepole pine, Engelmann spruce, and subalpine fir; in local situations it may also be found in ponderosa pine forest. They also occur in urban settings, sometimes congregating under streetlights at night to feed on insects (Hammerson 1999, P. Hendricks personal observation). Normally they remain fairly close to ponds, lakes, reservoirs, and slow-moving rivers and streams during the day, but may range widely at night. Eggs and larvae develop in still, shallow areas of ponds, lakes, or reservoirs or in pools of slow-moving streams, often where there is sparse emergent vegetation. Adult and juvenile boreal toads dig burrows in loose soil or use burrows of small mammals, or occupy shallow shelters under logs or rocks. At least some toads hibernate in terrestrial burrows or cavities, apparently where conditions prevent freezing (Nussbaum et al. 1983, Koch and Peterson 1995, Hammerson 1999).

Maxell et al., 1998 state:

We believe that the status of the Boreal toad is largely uncertain in all Region 1 Forests. …Briefly, factors which are a cause for concern over the viability of the species throughout Region 1 include: (1) a higher degree of genetic similarity within the range of Region 1 Forests relative to southern or coastal populations; (2) a general lack of both historical and current knowledge of status in the region; (3) indications of declines in areas which do have historical information; (4) low (5-10%) occupancy of seemingly suitable habitat as detected in recent surveys; (5) some evidence for recent restriction of breeding to low elevation sites and; (6) recent crashes in boreal toad populations in the southern part of its range which may indicate the species' sensitivity to a variety of anthropogenic impacts.

Bartelt and Peterson, 1994 note:

Female toads traveled up to 2.5 km away from water after breeding and their dispersal movements were significantly linear. In foraging areas, the movements of all toads were significantly influenced by the distribution of shrub cover. The data suggest that toads may have avoided macrohabitats with little or no canopy and shrub cover (e.g., clearcuts).

…if a forested area that lies between a breeding pond and a traditional hibernaculum of toads is clearcut and becomes hot and dry for toads, this could interrupt their seasonal migrations and could endanger these toads. If a forested area lying between two breeding sites is clearcut, this could interrupt gene flow between these sites, and thus isolate these gene pools and may reduce the stability of both populations.

Mountain Quail

FOC comments noted that there were no population estimates or trends in the DEIS for mountain quail. We also noted there was no analysis in the DEIS based on best available science. The FS did not respond to those comments. "

The wildlife specialist report states, "There are no recent sightings of mountain quail in the South Fork Clearwater drainage and it is believed that **this species has been nearly extirpated from the basin** (USDA 1998, pgs 20, 166). Mountain quail surveys were conducted in 2012 on the north side of the South Fork Clearwater River. No mountain quail responses were reported. Targeted surveys were also completed within and near the project area in 2016 and 2017; **no detections were recorded** (IBO 2016, IBO 2017)." (Emphases added.)

Clearly, the FS has no plan to recover or maintain a viable population of mountain quail, in violation of NFMA.

The Wildlife Report states, "The burning of slash may temporarily set back the post-fire shrub growth and subsequent nesting habitat for mountain quail, but over the long-term, would improve habitat conditions for mountain quail." Also, the Selected alternative "'May impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the populations or species' and may even have a 'Beneficial Impact.'" The report cites no monitoring or other data indicating mountain quail populations have responded favorably to such management, leaving claims of benefit unsupported by any empirical evidence. This misleading analysis violates NEPA.

White-headed Woodpecker

FOC comments stated, "The DEIS doesn't explain why white-headed woodpeckers …are not found in the project area." The FS responded that no explanation is needed.

The Wildlife Report states, "Surveys have been conducted in high-quality habitat west of Peasley Creek with no white-headed woodpecker being found. Incidental sightings were documented in 1980 (Mill Creek) and 1995 (Johns Creek). Surveys were also conducted within the project area and along the South Fork of the Clearwater River in 2016, 2017, and 2018. Detections were recorded along the South Fork only during 2017 efforts (IBO 2016, IBO 2017, IBO 2018)."

Also, the Selected alternative "'May impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the populations or species' and may even have a 'Beneficial Impact.'" The report cites no monitoring or other data indicating white-headed woodpecker populations have responded favorably to such management, leaving claims of benefit unsupported by any empirical evidence. This misleading analysis violates NEPA.

Clearly, the FS has no plan to recover or maintain a viable population of mountain quail, in violation of NFMA.

Pygmy nuthatch

FOC comments state:

> Since the (pygmy nuthatch) nests in dead pines and live trees with dead sections, it prefers old-growth, mature, undisturbed forests (Szaro and Balda 1986)." That's true of many

wildlife analyzed in the DEIS. Yet since the focus of the project is to suppress the natural processes that create such vital habitat components (as is most all timber sale projects on this Forest), how can viability be assured? There are no analyses of habitat trends for wildlife which consider the current management regime.

We discuss in another section how the FS's management emphasis will still rotate around fire suppression and active management in response to the adverse landscape impacts that is alleged to cause, resulting in chronically reduced habitat values for wildlife.

Fringed Myotis, Long-eared Myotis, Long-legged Myotis, Townsend's Big-eared Bat
The FS doesn't state if these Sensitive native species are found in the project area, or if surveys have been conducted.

FOC comments stated:

> "(E)ffects to Townsend's big-eared bat, long-eared, long-legged, or fringed myotis populations at the local or regional scale, or alteration of current population trend, are not expected to be measurable from the cumulative effects of Alternative 2, 3, and 4, based on the amount of suitable habitats remaining inside the project area outside of the harvest units and across the forest." This is nonsense because the DEIS doesn't quantify suitable habitat for these species, conducing only "qualitative" analysis.

The FS did not respond.

FOC comments also stated:

> "(E)ffects to Townsend's big-eared bat, long-eared, long-legged, or fringed myotis populations at the local or regional scale, or alteration of current population trend, are not expected to be measurable from the cumulative effects of Alternative 2, 3, and 4, based on the amount of suitable habitats remaining inside the project area outside of the harvest units and across the forest." This is nonsense because the DEIS doesn't quantify suitable habitat for these species, conducing only "qualitative" analysis.

Again, the FS did not respond.

The amount of existing habitat for bat species appears to be underestimated or downplayed. This in turn results in significant underestimates of potential habitat loss for these bat species.

Fringed myotis bats are associated with drier forest types particularly Ponderosa Pine (Keinath 2004, Lacki and Baker, 2007). Lacki and Baker (2007) demonstrated that most roost snags extended above the existing canopy by an average of 33.8 feet and were larger than random snags (32.5 inches for roost trees and 20.8 inches for random snags). Random snags generally had heights that did not extend above the existing canopy (-8.2 feet). Roost trees occurred in stands with more trees per acre (239 vs 119 per acre) and higher basal areas of trees over 9.8 inches in diameter (125.5 ft^2/acre vs 69.7 ft^2/acre).

For long-legged myotis bats, intact snags were preferred over broken topped snags, since they were more likely to extend above the canopy. In Oregon, bats preferred areas with high snag basal area and a diversity of stands within 250 meters of the roost tree. Bats in Oregon also preferred trees without broken tops. In Idaho, bats preferred roost trees in stands with lessor amounts of edge and fewer stand types within 750 meters of the roost tree.

Moose

The Wildlife Report states:

> There is no Management Area 21, winter moose habitat, designated within the Hungry Ridge project area. Moose winter habitat can also be found in vegetation response unit 7 (VRU 7), grand fir/Pacific yew communities. There is approximately 1407 acres of VRU 7 in the project area. Approximately 277 acres (20%) of VRU 7 has been harvested from 1986 through 2004 with regeneration harvest methods. … Approximately 302 acres (21%) of moose winter habitat in VRU 7 is slated for harvest with about 1 mile of temporary road construction. Approximately 298 acres (21%) of regeneration harvest and 4 acres (<1%) of commercial thinning is proposed.

So the FS is proposing a cumulative destruction of about 41% of the moose's preferred habitat in the project area, along with providing more road access for poachers or other habitat disturbance. This is in the context of, as the DEIS admits, "Based on harvest record and hunter reports, moose populations in the Clearwater Region are declining (Nadeau 2013). … The moose populations in Unit 15, which encompasses the project area, are not large enough to support a hunting season anymore."

Our comments asked, "What is the cause of Unit 15 population decline?" The FS responded, "Reasons for these declines are poorly understood,…"

Despite the Forest Plan's emphasis on winter habitat (MA-21) for conserving moose populations, now the Wildlife Report is claiming "…more recent research suggests summer forage quality and availability is the most limiting habitat factor impacting moose populations across northern Idaho today (Schrempp 2017)." The FS should be addressing this issue programmatically, investigating cumulative effects on summer forage quality and availability so that conservation efforts for moose can reverse the noted population decline.

The FS doesn't demonstrate the project would meet the Peek et al., 1997 guidelines. Previous studies of moose habitat on the NPNF have documented the importance of dense understories of Pacific yew stands under old-growth grand fir communities (Pierce and Peek 1984). The importance of these habitats has been documented in the Forest Plan with a special management area (MA-21) and local habitat management guidelines that have been developed based on that past research (Peek et al. 1987).

These guidelines are the best available science regarding this management indicator species and have been prepared by one of the most preeminent moose biologists in North America (Dr. James Peek). Co-authors on the paper are graduate student John Pierce (Currently Chief Wildlife Research Scientist for the Washington Department of Fish and Wildlife), Dean Graham (Former Nez Perce National Forest Biologist) and Dan Davis (Former Clearwater National Forest Biologist). The guidelines suggest that no more than 45% of MA 21 should be in age classes younger than 90 years and that no more than 14% should be logged in any 30-year period.

Peek et al., 1987 guidelines should be considered on moose winter range outside of MA-21.

The FEIS fails to demonstrate management consistency with Forest Plan MA-21 direction in a logically defined cumulative effects analysis area or forestwide.

Remedy: Select the No Action alternative. Alternatively, prepare a Supplemental EIS that addresses the analytical and scientific issues identified above.

Proctor, Michael F., Bruce N. McLellan, Gordon B. Stenhouse, Garth Mowat, Clayton T. Lamb, and Mark S. Boyce, 2020. Effects of roads and motorized human access on grizzly bear populations in British Columbia and Alberta, Canada. Ursus, 2019(30e2):16-39 (2020). https://doi.org/10.2192/URSUS-D-18-00016.2

WATER QUALITY AND FISHERIES

Pages 4 to 14 of our comment letter addressed many questions and concerns, the majority of which went unanswered in the response to comments section. Further, they don't support the conclusions in the FEIS. It should be noted that there are some significant differences from the DEIS to the FEIS, which seem suspect as they come to very different conclusions than the DEIS about current conditions.

Water quality is crucial for fish species such as the threatened steelhead and bull trout. Steelhead numbers are plummeting. Cumulative impacts to their habitat are even more important. Bull trout are very sensitive to disturbance and require very cold and clean water.

Gloss (1995) shows that NEZSED (and FISHSED upon which it is based) very significantly underestimated average annual sediment yield in watersheds as compared to what was observed. Even observation such as traps to catch sediment may not pick up all sediment. Further, NEZSED does not take into account mass wasting and inadequately looks at landings. Nonetheless, NEZSED[49] is a watershed model, unlike most iterations of WEPP, and when they are compared, NEZSED apparently results in higher estimates of sediment. For example, page 230 of he FEIS (WEPP) page apparently shows a lesser probability of sediment delivery than does page 229 of the NEZSED run. While the stated metrics are slightly different (percent yield over baseline versus percent probability of sediment delivery)[50], it is fair to say the WEPP runs reported in the FEIS suggest and even lower chance of sediment delivery than do the NEZSED runs. For example, the FEIS page 230 does not present sediment delivered from roads (construction, reconstruction,

[49] NEZSED was found inadequate (Memorandum Decision Order, page 18, of CASE NO. CV 04-447-S-MHW, an injunction issued against the Whiskey South Integrated Resource Project). Inventory techniques developed by the agency including GRAIP to assess the impacts that roads have on watersheds may yield better results than either NEZSED or WEPP.

[50] The FEIS lists the discussion on pages 227 to 229 about NEZSED as sediment yield and the discussion on pages 229 and 230 about WEPP and Sediment Yield-FS WEPP so a comparison between the two would be in order by the agency's own admission.

hauling). Given NEZSED's recognized weaknesses, a model that projects even less sediment is further from reality than NEZSED.

It should also be recognized that the NEZSED conclusions in the FEIS are drastically different than those in the DEIS. There are no complete NEZSED sediment runs in either the FOIA information or the project file on the website. One of the documents included the FOIA (10dd-0056_HR_StramStats) has a disclaimer and a warnings for peak-flow statistics. "One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors" according to the document.

Similar differences between the DEIS and FEIS are for the reports of cobble embeddedness. These new measurements are apparently much less rigorous. It is also not clear if the same people conduced the measurements in 2012 and 2017 and 2018 or if the same protocol was used. This is documented in Harry Jageman's objection letter of December 14, 2019, which is attached to this objection and which we incorporate into our objection. Further, two or at most three data points are not sufficient to establish trend.

Thus, it is doubtful any sort of upward trend, as required by the forest plan, is being met. The changes from the DEIS to the FEIS are particularly suspicious. Projects within the Nez Perce National Forest must be consistent with the Forest Plan. 16 U.S.C. § 1604(i). The feasibility of the Hungry Ridge proposal is based upon the premise that the upward trend standard for water quality objectives (Forest Plan, Appendix A) exists. Timber management concurrent with improvement efforts can occur in below objective watersheds as long as an upward trend in habitat carrying capacity is documented.

Factual documentation of an upward trend requires a credible set of time-series data in order to deal with statistical variation. The project record provides no such trend information.

While it is commendable that the Forest Service is decommissioning non-system roads, replacing bad culverts and requiring "no harvest" PACFISH buffers, it remains that the Agency is implementing a failed management strategy. The script is: do some rehabilitation and then implement a large timber sale. This is a press disturbance and will not recover degraded watersheds and fish habitats. It has been done countless times. We object to this description as restoration.

The Hungry Ridge timber sale would generate impacts with extensive timber harvesting, temporary road construction, and reconstruction of existing roads, road decommissioning, culvert replacement, yarding, and skidding. The contention that no measurable sediment will be delivered to prescription watersheds and fish habitats is largely based on PACFISH buffers (RHCAs), temporary roads, best management practices (BMPs), and the hope that no large storms will occur. PACFISH buffers are certainly not "fail-safe." The Forest Service only has to consult their documentation of the 1995-96 storm event in the Clearwater Basin that resulted in hundreds, if not thousands, of road failures, stream blowouts, and landslides in developed watersheds to refute the "fail safe" contention (McClelland et al., 1997). During this storm, PACFISH buffers (100-300 ft.) did not effectively stop significant sediment delivery from road failures and other mass erosion events. Large amounts of sediment were delivered to the streams. Further, the results from flood events on the Nez Perce and Clearwater National Forests were associated with roads 60% of the time (see Lloyd 2017). The project record indicates that existing roads compromise many RHCAs. With the advent of climate change, we can expect more frequent and severe storms.

Temporary roads are frequently not temporary. Sediment and impacts delivered to degraded streams from temporary roads are not necessarily temporary or short term. Spawning and rearing habitats already degraded from past development are more vulnerable to long-term impacts from additional sediment loading. In addition, currently depressed populations of steelhead trout could suffer further long-term impacts from lower quality habitats.
The “fail safe” contention extends to best management practices (BMPs). Espinosa et al. (1997) documented the failure of BMPs to adequately protect salmon habitat on the Clearwater National Forest. Failure occurs because recovery is not the primary objective of the BMP concept.
Further, the EA fails to look at cumulative impacts from road reconditioning. Many roads, including temporary road templates, are grown over and not contributing much sediment now. They will be rebuilt and contribute sediment under the proposed action.

Further, road decommissioning may not necessarily occur if funding is not secured, or may occur at a later date.

As with other topics, addressed in this objection, the lack of consistent monitoring makes any determinations by the Forest Service that there is an upward trend in water quality or fish habitat suspect. Point in time studies are useless in determining trend. That is the point of monitoring, to determine trends.

We raised the inadequacy of BMPs in our comments, specifically as they relate to areas known for mass wasting. Forest Service analysis shows that roads were responsible for most of the slides in 2017 (see attached Lloyd 2017).

In sum, the FEIS does not make the case that the plan’s water quality and fish habitat standards and objectives are being followed or being met. It has been over thirty years since the plan was signed. The fact that streams are not meeting standards is an indictment of Forest Service management. This failure threatens species such as steelhead and bull trout and fails to comply with the ESA. It also threatens other aquatic species.

Remedies:
1) Withdraw the ROD and FEIS and prepare and EIS that complies with NEPA, the ESA and NFMA, if this project goes forward
2) Don’t construct any new roads, including temporary
3) Don’t long or build roads in all watersheds and streams not meeting Forest Plan objectives and standards for CE or any other parameter.
4) Don’t log in any watershed with critical steelhead or bull trout habitat.

SOILS
Our comments raised concerns including a big picture concern that the lack of consistent monitoring makes it hard to verify that the Forest Service is meetings its duties under NFMA to protect the soil

resource. We also addressed sensitive soils and the DSD standard at both the regional and forest levels. While we are concerned with the high level of DSD these standards allow, even these standards would not met. There is a difference between the standards, 20% for the forest plan versus 15% for the region. As such, the Regional Standard—15% DSD—on the surface is more stringent than the 20% standard in the Forest Plan. As we show below, the regional standards would be exceeded (and at least one instance, the Forest Plan standard).

Table 3-32 shows units 4, 5, 7, 10, 11, 12, 14, 16, 17, 18, 19, 25, 55, 61, 62, 67, 68, 69, 72, 73, 131, 15 A and B, 21A, B, and C, 25A, 88 A and B, and 8A and B, would all exceed the regional standard of 15% under alternative 2.

Further, Table 3-34 shows many units are in landtypes that are prone to landslides or have sensitive soils. Given the lack of addressing questions about soils raised in the Forest Plan (and addressed in our comments) and the clear failure of BMPs to prevent mass wasting events associated with roads and other human-caused disturbances, the FEIS is inadequate in looking at impacts to soils that occur on sensitive landtypes.

Remedies:

1. Prepare an EIS that meets NEPA and NFMA requirements.
2. Drop all proposed roads and logging unit that are landslide prone or have other sensitive soils types.
3. Drop all proposed roads and logging units (activity areas) that would be over the 15% DSD standard.