

April 19, 2021

Matt Anderson, Forest Supervisor/Responsible Official
Seth Carbonari, Westfork District Ranger
Mud Creek Project
1801 N. First St.
Hamilton, MT 59840-3114
RE: Comments Related to the Mud Creek Draft EA

Submitted online via <https://cara.ecosystem-management.org/Public/CommentInput?Project=55744> and e-mailed to Seth Carbonari seth.carbonari@usda.gov and Matt Anderson matthew.anderson3@usda.gov Please acknowledge receipt.

Commentors: Friends of the Bitterroot, Alliance for the Wild Rockies, Native Ecosystems Council, and WildEarth Guardians

Date: April 15, 2021

Dear Supervisor Anderson,

We appreciate the opportunity to comment on your Mud Creek Environmental Assessment, dated March 24, 2021. These comments are supplemental to the Mud Creek EA Comments (attached here), dated April 7, 2021 that were submitted by Native Ecosystems Council, Alliance for the Wild Rockies and Friends of the Bitterroot. This proposed project, covering approximately 48,486 acres, is to be located on the West Fork Ranger District, including the West Fork Bitterroot River-Rombo Creek watershed, and portions of the Nez Perce Fork-Nelson Lake, Little West Fork, Lloyd Creek, Lower Blue Joint, and Painted Rocks Lake watersheds, southwest of Darby. It borders the 5800 acre CE Piquett Creek Project.

Members of Friends of the Bitterroot attempted to reach the site by vehicle on April 13, 2021. Due to deep snow, all of the Mud Creek Project areas designated as "Potential Openings > 40 acres" and indeed nearly the entire project area has been inaccessible during the Forest Service plan release and entire comment period. None of the 22 "focal areas" > 40 acres, ranging from 71 acres to 585 acres, are accessible. Many of the focal areas are adjacent to each other, separated by small buffers or creek drainages, with the potential to create clearcuts from 71 acres to 1,148 acres. This could result in significant ecological damage. The Forest Service cannot expect the public to participate in the NEPA process in a meaningful way when they have not had the opportunity to observe the areas that are under consideration for logging and road building. We respectfully request the Forest Service open a new comment period for the Mud Creek Project that would begin when the area becomes accessible and extend for a period of 30 days.

We incorporate and attach herein, Scoping Comments submitted by Friends of the Bitterroot dated October 7, 2019, the Mud Creek DEA comments, dated April 7, 2021 submitted by Alliance for the Wild Rockies, Native Ecosystems Council, and Friends of the Bitterroot, Mud

Creek DEA comments submitted by the Alliance dated April 20, 2021, and Mud Creek DEA comments submitted by The Sierra Club dated April 20, 2021. We have signed on and incorporate Mud Creek DEA comments submitted by Friends of the Clearwater, Alliance for the Wild Rockies, WildEarth Guardians Native Ecosystems Council, and Friends of the Bitterroot dated April 20, 2021

The Draft EA documentation claims there is a **Need** to:

- Implement road improvements and best management practices (BMPs) to address chronic sediment sources to improve water quality and fish habitat;
- Decommission road segments to reduce road densities and improve elk security where road segments are not needed for future management;
- Address discrepancies (e.g., gated roads designated as open) between on-the-ground road conditions and travel status in the Bitterroot Travel Management Plan; and
- Provide for additional recreational opportunities, by creating motorized and non-motorized trail opportunities when resource concerns can be mitigated.

The Draft EA documentation then states that the **Purpose** of the project is to:

- Improve landscape resilience to disturbances (such as insects, diseases, and fire) by modifying forest structure and composition and fuels;
- Reduce crown fire hazard potential within the wildland-urban interface, adjacent community protection zone, and low-severity fire regimes;
- Improve habitat and forage quality and quantity for bighorn sheep, mule deer, elk, and other regionally sensitive species; and
- Design and implement a suitable transportation and trail system for long-term land management that is responsive to public interests and reduces adverse environmental effects.

The Draft EA **Need** focuses entirely on roads and trails while the **Purpose** introduces the topics of resilience to disturbance (such as insects, diseases, and fire) and reducing fire potential that are not included in the Draft EA **Need**. No explanation is offered regarding how improving landscape resilience and/or reducing crown fire hazard potential addresses roads and trails issues. Perhaps that is because no logical justification exists.

Interestingly, the Purpose and Need (PN) itemized in the Draft EA is different from wording included in the scoping documents which described the “original” Purpose and Need for this project as:

- Improve landscape resilience to disturbance (such as insects, diseases, and fire) by modifying forest structure and composition, and fuels.
- Design and implement a suitable transportation and trail system for long-term land management that is responsive to public interest and reduces adverse environmental effects.
- Conduct a programmatic Forest Plan amendment related to elk habitat objectives.

A valid question is, “Why the change?” It is essential that the underlying PN for the proposed project be directly addressed.

The stated **Purpose**, “To ‘improve resilience..... by modifying forest structure and composition’ narrows the alternatives to a single choice, active management (to modify forest structure and composition).” That declaration prevents any other alternatives for consideration, even if other alternatives might be more effective. For example, recent research suggests the best way to improve resilience to insects and disease is through passive management to let the forest evolve and adapt.¹ CEQ’s A Citizens Guide to NEPA, p. 16, states, “The purpose and need statement explains to the reader why an agency action is necessary and serves as the basis for identifying the reasonable alternatives that meet the purpose and need.”² This project’s **Purpose** violates legal precedent and rules out all other alternatives to achieving the goal of “improving resilience” without providing justification. Additional alternatives to the proposed action should be specified.

Our comments begin by focusing on the FS claim that the project will improve landscape resilience to disturbance.

First, insects. The Forest Service (FS) has insisted for years that when insects begin damaging a patch of forest they must be stopped because infestations increase the risk of more insect invasions and catastrophic wildfire. The FS’s recommended tools are always logging, thinning, and prescribed fire. Recent research contradicts those FS claims. A study by Meigs, G.W. et al (2016) indicates that not only do insect infestations not increase the likelihood of wildfire but that in the event of wildfire the severity is not increased.³

Other research by Hart, S.J. et al (2015) revealed that widespread and severe insect infestation restrict subsequent invasions.⁴ This conclusion conflicts with current FS claims.

Contrary to FS assertions that a mountain pine beetle outbreak increases wildfire risk, spatial overlay analysis shows no effect from outbreaks on subsequent area burned during years of extreme burning across the West. These results refute the assumption that increased bark beetle activity increased the area burned.^{5 6}

Weather, not insects, is what determines wildfire behavior.⁷

¹ Pearce, F. (2020) Natural Debate - Do Forests Grow Better With Our Help or Without -

<https://e360.yale.edu/features/natural-debate-do-forests-grow-better-with-our-help-or-without>

² CEQ’s A Citizens Guide to NEPA - <https://ceq.doe.gov/docs/get-involved/citizens-guide-to-nepa-2021.pdf>

³ Meigs, G. W. et al. (2016) Do insect outbreaks reduce the severity of subsequent forest fires -

<https://iopscience.iop.org/article/10.1088/1748-9326/11/4/045008/meta>

⁴ Hart, S.J. et al. (2015) Negative feedbacks on bark beetle outbreaks: widespread and severe spruce beetle infestation restricts subsequent infestation.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0127975>

⁵ Meigs, G. W. et al. (2016) Ibid.

⁶ Hart, S.J. et al. (2014) Area burned in the western United States is unaffected by recent mountain pine beetle outbreaks - <https://www.pnas.org/content/112/14/4375>

⁷ Hart, S.J. and Preston, D.L. (2020) Fire weather drives daily area burned and observations of fire behavior in mountain pine beetle affected landscapes - <https://iopscience.iop.org/article/10.1088/1748-9326/ab7953>

Second, disease. Mistletoe is the disease which seems to be the most troubling to the FS. Reduction or eradication are given as a goal in the Forest Vegetation/Silviculture Report document attached to the project's Draft EA. Interestingly, a FS leaflet explains that, "It is a pest ONLY (emphasis added) where it interferes with management objectives, such as timber production."⁸

That same pamphlet points out that dwarf mistletoe is important to wildlife.

"Some rodents, such as porcupines and squirrels, feed on bark tissues at infection sites because of the accumulations of starch and nutrients at these locations. The large witches' brooms caused by the parasite are used for hiding, thermal cover, and nesting sites by grouse, hawks, owls, squirrels, porcupines, martens, and other wildlife. Northern spotted owls east of the Cascades show an attraction to Douglas-fir witches' brooms for nest sites."⁹

The fact that the FS insists in this Draft EA on reducing/eradicating dwarf mistletoe gives substance to the widely held belief that the main focus of this project is timber production even when detrimental to certain wildlife species.

Third, wildfire. In project after project, the FS claims that the forest is primed for catastrophic wildfire. The oft-repeated assertion is made that the forest is too thick, overstocked with small trees, and contains an overabundance of ladder fuels. Those issues are blamed on long-term wildfire suppression (EA at 10) by previous FS management actions that (ironically) must now be overcome using current FS management activities.

The FS continues the policy of indiscriminate fire suppression even while claiming the results are a potential "catastrophic fire" hazard.

Those FS claims related to the history of wildfire relies heavily on research performed by Arno (1976). That study focused on an extremely small portion of the Bitterroot Forest and was extrapolated to the entire Bitterroot National Forest (BNF). The assumption was made that approximately 4% of the BNF, which should have experienced multiple fires over the past 129 years, has even burned once. That postulation is problematic and statistically unsound. Arno's sample was too small to support such an hypothesis.¹⁰

The fact is ignored that over the past 129 years (an approximate) 4% of the BNF burned one or more times was determined by climatic conditions which existed during that period. Claiming that more of the BNF "should have burned one or more times" during that period is subjective and based upon a silviculturist-imagined "perfect world" forest which supplies an endless supply of readily marketable timber.

⁸ Hadfield, J.S. (2000), Douglas Fir Dwarf Mistletoe: Forest Insect and Disease Leaflet
<https://www.fs.fed.us/foresthealth/docs/fidls/FIDL-54-DouglasFirDwarfMistletoe.pdf>

⁹ Hadfield, J.S. (2000) Ibid.

¹⁰ Arno, S. F. (1976) The historical role of fire on the Bitterroot National Forest -
https://forest.moscowfs.wsu.edu/smp/solo/documents/RPs/Arno_RP-INT-187_1976.pdf

As shown by numerable studies, the frequency and severity of wildfire is driven mostly by climate/weather (high temperature, drought, and wind) and not by the availability of fuels.¹¹

In fact, activities such as logging, thinning, and road building (even temporary roads), each of which is being proposed as part of this project, have been shown to increase, not reduce, the severity of subsequent wildfires.¹²

When confronted with that argument during the scoping process, the FS response was:

“The effects of proposed treatment activities on potential fire behavior is documented in the fire/fuels effect analysis. There is also abundant scientific literature that shows the effectiveness of fuel treatments on reducing fire behavior. (Safford, 2009, Omi, 2010, Peterson, 2005, Stephens, 2012, Strom and Fule 2007; Peterson 2007; Omi and Martinson 2002 & 2004; Agee and Skinner 2005; Graham et al. 2004 & 2009; Pollet and Omi 2002; Fule et al. 2001; Hudak et al, 2011; Prichard et al. 2020) “

Granted, there is “abundant scientific literature” showing the fire/fuels effects that the Agency wishes to support. However, of the referenced literature, only one, Prichard et al (2020), is recent. The others are more than a decade old and have been contradicted by more recent studies. It is also notable that the Prichard literature is based on computer modeling, a method that does not carry the validity of on-the-ground research. The FS should be using the latest and best science.¹³

Given the results of more recent research which draws the opposite conclusions, it is disingenuous for the Forest Service to continue claiming that the size of large fires is increasing to persuade the public that logging and thinning the BNF (even in the WUI) will reduce risk.¹⁴

The BNF landscape is vast. Efforts to obtain funds (HFRA) and spend millions of dollars on thinning, is unlikely to be effective at reducing wildfire and will not make anyone safer. It can't be predicted exactly where wildfire will occur and “thinned” forests will simply grow back (seldom, if ever, are “thinning” projects revisited). As paradoxical as it may appear to some, recent research reveals that forests with the most active “management” produce the highest severity wildfires.^{15 16}

Please disclose a map showing where recent fires have intersected recent logging/thinning projects. Is there any demonstrable beneficial effect?

¹¹ Abatzoglou, J.T., and A.P. Williams. 2016. Impact of anthropogenic climate change on wildfire across western US forests. PNAS <https://www.pnas.org/content/113/42/11770>

¹² Bradley, C.M., et al. (2016) Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States? <https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/ecs2.1492>

¹³ Berner, L.T. et al. (2017) Tree mortality from fires, bark beetles, and timber harvest during a hot and dry decade in the western United States [2003-2012] - <https://iopscience.iop.org/article/10.1088/1748-9326/aa6f94/meta>

¹⁴ DellaSala, D.A. and C.T. Hanson (2019) Are wildland fires increasing large patches of complex early seral forest habitat? Diversity 2019, 11, 157 <https://www.mdpi.com/1424-2818/11/9/157>

¹⁵ Bradley, C.M., et al. (2016) *ibid.*

¹⁶ Erb, K.H. et al. (2018) Unexpectedly large impact of forest management and grazing on global vegetation biomass - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5756473/>

Given that many areas of the BNF have burned in recent years, please provide documentation where those recent fires burned much more severely in size and intensity.

For many years the FS has been stoking the public's fear of wildfire by insisting that the only way to prevent homes and other structures from burning is to thin (log) all forests withing two miles of all man-made structures, an area referred to as the wildland-urban interface (WUI). Multiple after-wildfire, on-the-ground research projects by one of the Nation's foremost fire scientists have clearly shown that improvement to a structure's fire resistance plus the thinning of trees and undergrowth within a couple of hundred feet of the structure, called the Home Ignition Zone (HIZ), is the most effective way to reduce the likelihood of damage during even the most destructive wildfires. It is impossible to "manage" (log/thin) our way out of wildfires. Instead, durable solutions such as home hardening should be encouraged and pursued.^{17 18}

While there are certain risks to people from wildfires, scientific studies show that forests most often benefit ecologically from mixed-severity wildfires.¹⁹ Using "catastrophic" rhetoric to describe wildfire, insect activity, and disease in order to gain support for management activities (logging/thinning) on the Forest is destructive in the long term. Fires, insect activity, and disease are not ecologically destructive.²⁰ It is logging, road building and suppression before, during, and after such natural occurrences that have the biggest impact on water quality and quantity, wildlife, and natural processes.

The earth's climate is warming substantially. Recent research indicates that, no matter what mitigation actions are initiated, human activity has already increased greenhouse gas enough to warm the planet by at least 2 – 2.5 degrees Celsius (3.6 – 4.5 Fahrenheit). Nowhere in the Mud Creek Project Draft EA documentation, is there an indication that the IDT has performed more than cursory research into the impact a much warmer climate will have on the Bitterroot Forest. That is particularly disturbing given recent research which clearly shows that the total greenhouse gas emissions from logging is at least three times the levels produced during an average wildfire season.^{21 22} Please disclose and discuss the effects of increasing regeneration failures on the BNF and how you plan to accommodate increasing regen failures.

It seems that the stated PN of the Mud Creek Project is not based upon the most recent scientific research and studies. Rather, it appears the PN is based upon a politically motivated desire for an increase in logging activities. This Agency's continual use of the same PN for

¹⁷ Cohen, J. (2019) An Analysis of Wildland-Urban Fire with Implications for Preventing Structure Ignitions - https://www.eenews.net/assets/2019/01/08/document_gw_02.pdf

¹⁸ Cohen, J. (2016) An Examination of Home Destruction (Roaring Lion Fire) - <http://dnrc.mt.gov/divisions/forestry/docs/fire-and-aviation/prevention/roaring-lion-fire-document-for-web.pdf>

¹⁹ DellaSala, D.A., and Hanson, C.T. (2015). The ecological importance of mixed-severity fires - <http://hs.umn.edu/dbs/labs/hutto/documents/pubs-pdfs/DellaSalaetal2015.pdf>

²⁰ DellaSala, D.A. et al. (2015) Flight of the Phoenix: Coexisting with Mixed-Severity Fires - <http://hs.umn.edu/dbs/labs/hutto/documents/pubs-pdfs/DellaSalaetal2015.pdf>

²¹ Oregon Department of Energy, 2018 Biennial Energy Report - <https://energyinfo.oregon.gov/2018-ber>

²² Harris, N.L. (2016) Attribution of net carbon change by disturbance type across forest lands in conterminous US - <https://cbmjournals.biomedcentral.com/track/pdf/10.1186/s13021-016-0066-5.pdf>

projects is misleading and deceitful. Worse, executing the proposed activities contained in this project not only contribute to global warming and harm existing ecological stability but drastically reduce the capacity of the BNF to reestablish the resilience needed to cope with scientifically projected future conditions.^{23 24 25 26}

There is a disagreement with the stated PN for this project which uses scare tactics related to wildfire, insects, and disease to garner public support for logging activities. When confronted with the hypothesis that the PN for this project is not based on sound science but is in reality a campaign of deflection²⁷, the Agency response continues to be that, such arguments are “beyond the scope and scale of this project.” That response asserts that once the project is defined by the FS, its underlying purpose cannot be questioned.

If the Forest Service wants a logging project, it should say so in clear, unambiguous language which anyone can understand. Anything else gives the impression of being fraudulent.

It has been suggested that if the FS must do something positive to reduce wildfire (and to justify its existence), it should do everything in its power to restore the beaver to the lands the Agency manages. The beaver, a mere rodent, has repeatedly shown its taxpayer free water-management activities do more to reduce the effects of wildfire and road sediment than the current assortment of Forest Service standard practices.²⁸

Since the beginning of public participation on the Mud Creek proposal Friends of the Bitterroot has advocated that any activities conducted in what little old growth remains on the BNF preserve all the characteristics that make old growth special or unique for wildlife.

Friends of the Bitterroot has also consistently advocated no roads (temporary or otherwise) be constructed, given the existing road system is already unaffordable to maintain, leading to chronic and repeated unacceptable environmental damage such as the Spring 2017 mass erosion event of the Willow Creek Road #969 in the Gold Butterfly area. Friends of the Bitterroot has asked that no roads or temporary roads be built or reconstructed in the IRAs WSAs and RWAs in the area.

²³ Baker, W.L. (2018) Transitioning western U.S. dry forests to limited committed warming with bet-hedging and natural disturbances - <https://esajournals.onlinelibrary.wiley.com/doi/10.1002/ecs2.2288>

²⁴ Buotte, P.C. et al. (2019) Carbon sequestration and biodiversity co-benefits of preserving forests in the western United States - <https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/eap.2039>

²⁵ McNulty, S.G. et al. (2014) The rise of the mediocre forest - why chronically stressed trees may better survive extreme episodic climate variability - https://www.srs.fs.usda.gov/pubs/ja/2014/ja_2014_mcnulty_001.pdf

²⁶ Prichard, S.J. et al. (2020) Fuel treatment effectiveness in the context of landform, vegetation, and large, wind-driven wildfires - <https://doi.org/10.1002/eap.2104>

²⁷ Deflection campaign – A technique used to divert attention from the intended agenda (in this case, logging) by exploiting the fear of a different situation (in this case, wildfire).

²⁸ Goldfarb, B. (2020) How beavers became North America's best firefighter - <https://www.nationalgeographic.com/animals/article/beavers-firefighters-wildfires-california-oregon>

Members of Friends of the Bitterroot attended field trips and commented on scoping expressing these concerns and more. Friends of the Bitterroot commented on scoping, comments attached.

Following are additional points of contention related to specifics contained in the Mud Creek Project Draft EA documents dated, March 24, 2021

- This project appears to limit input from those outside the Agency because it includes little or no specifics related to the proposed activities on individual treatment units. The scoping comment period is requesting remarks for (pre-approved?) activities for which no information is offered. The Draft EA contains no reference to current law which allows for the replacement/substitution of NEPA requirements for public involvement. The recent court injunction on a similar (condition-based analysis) project in Alaska's Tongass National Forest suggests that such a project format is likely to be ruled illegal. The BNF should redesign this project to fall in line with an acceptable format.
- The large size of this project, over 45,000 acres, and the presence of ESA-listed species, and the scientific controversies mentioned above suggests that an EIS analysis is required. The Forest Service must prepare an EIS because this project may have a significant impact on the environment in both context and intensity. Please explain why this large project encompassing IRAs, WSAs and RWAs, home to bull trout, white bark pine, Canada lynx, possibly grizzly bears, rare plants, and an array of sensitive species is not a significant impact to the environment in both context and intensity. The scientific controversies involved, especially regarding fire science and climate change effects, also require that an EIS be prepared.
- The proposed excessive opening sizes for clearcuts violates the Bitterroot National Forest Plan standard that limits the maximum size of regeneration logging units to 40 acres. Under the National Forest Management Act, the Forest Service has a duty to ensure site-specific projects and authorizations comply with the Forest Plan. The proposed exceedances do not just go beyond the 40-acre limit from the Forest Plan standard. The Forest Service proposes openings that completely obliterate that limit and essentially render it meaningless by proposing 22 openings up to 200 acres. Standards, as compared to objectives or guidelines, are meant to be complied with. The Forest Service must explain this change by addressing why the reasoning for the Forest Plan Standard does not apply here. The EA does not provide any explanation for why the excessive size openings are necessary for this project. Without addressing the original basis for the Standard, the Forest Service's action lacks a rational basis and is arbitrary and capricious. Please explain the need for openings of up to 200 acres in size.
- The DEA claims that public notice was given for openings over 40 acres in scoping. Scoping merely announced that there would be openings of over 40 acres. No more information was given. The DEA describes general locations and sizes from 40-200

acres, but these locations are currently inaccessible and will be until June. Please announce an official 60-day comment period for openings over 40 acres beginning when the area is accessible to the public so that they have the opportunity to assess the areas and submit substantive comment.

- The comment period should also be extended because the Draft EA contains approximately 1,400 pages of information, all carefully worded to either support or (at a minimum) to not contradict the project's PN. That volume of information, which certainly required more than 30 days for the FS to generate, necessitates more than a 30-day period to thoroughly study and provide meaningful comment.
- The DEA is filled with references to specialist reports, one over a thousand pages, that "explain" their findings. The agency has a duty to clearly explain their conclusions and the specific reasoning behind those conclusions to the public in the DEA. They should not expect the public to search out their reasoning. Agency does not even provide a link to said documents.
- Though the provided FS maps of proposed roads and trails are readable, the maps made available to the public at FS offices and on the FS website depicting proposed commercial logging, WUI boundary, controlled burns, potential openings >40 acres, and the terraces map are not of sufficient scale, pixel/detail to be used in the field. The road numbers, creek names, and road locations are difficult or impossible to read.
- The decision to perform a single NEPA evaluation (EA) for such an extensive project (expected to span a 20-year period) is legally questionable and unquestionably invalid during a period when the climate is rapidly changing and grizzly bears are ranging in the area and dependent upon colonizing the Bitterroot Recovery Area for survival.
- Although the Draft EA promises beneficial work to remedy damage from project activity, the funding required to offset that damage is dependent upon future funding and not ensured. DEA at 9 describes aquatic organism passages that were previously approved are still awaiting funding. When was the NEPA that approved these completed and how long have these beneficial actions been awaiting implementation? The project should not be implemented without dedicated funding for all beneficial work to assure that damages will be offset.
- Insistence on instituting a project specific EHE Forest Plan Amendment as part of this project circumvents the Forest Plan review process. Including this proposed amendment is simply an attempt to sidestep BNF Plan requirements. Any and all amendments to the Forest Plan should be performed individually. In the case of reworking the EHE, because species besides elk are affected, analysis beyond the effect on elk is required. Since, according to public announcements, the BNF is in the process of developing a forest-wide Forest Plan amendment, this project should wait for that to be finished. It should provide the necessary cumulative effects analysis of the repeated use of project specific amendments across a broad area of the BNF. EHE site specific amendments have affected or are slated to affect in total 247,605 acres, 32% of the forest not protected by Wilderness Act or Wilderness Study Act.

- Fuel treatments more than 100 feet from structures have a negligible if any effect on the likelihood a structure will survive wildfire. A structure's chance of survival depends almost entirely upon its composition.
- Because humans are unable to select the most genetically fit and adaptive trees, allow insect and disease infestations to run their natural course. This provides natural thinning, increased species diversity, and is much more likely to provide a Forest more adaptive to climate change than any possible Forest Service management activities because valuable disease/insect resistant trees will survive and propagate.
- The DEA evaluation of prescribed fire and logging on whitebark pine within the project area is inadequate and does not provide adequate analysis of existing research. Whitebark pine is highly sensitive to fire, due to thin bark. The draft EA does not define why prescribed burning will be used to kill an undisclosed number of whitebark pine trees, including cone producing trees nor does it disclose when new trees will begin producing a significant amount of pine nuts and how the delay will affect wildlife in the area.
- The Draft EA contains inadequate analysis of project effects on animal species, including cutthroat trout, bull trout, grizzly bear, lynx, northern rockies fisher, black bear, multiple migratory bird species, cavity-nesting birds (snag habitat), bats, raptors, red squirrels, wolverine and other small mammals, etc. Also missing is an inventory of key wildlife habitat, a violation of NEPA.
- Cease the practice of cherry-picking outdated science to support the pre-determined, desired treatments which are proposed as part of this project. Science, in its truest form, is a dynamic, self-correcting process. By relying on outdated research, the BNF appears to have chosen a point in time when research supported a never-ending supply of trees to the timber industry. Therefore, the IDT is not using the most up-to-date research and studies to determine treatments on the BNF. Agency management should support the findings of the specialists, not politically motivated "directives."
- This project should be designed so that no new roads are required (this includes temporary roads, undetermined roads, and/or system roads). Roads have been repeatedly shown to have the most detrimental effect on forest ecology, wildlife, and water (both quality and quantity). If a management activity cannot be performed without the addition of roads, that activity should be deleted from the project.
- The current roads analysis is flawed because it depends upon later funding to apply and maintain BMPs. Additionally, there is no assurance that roads will be maintained after the project is completed—the project files contain no information regarding past and

current BNF road maintenance nor does it identify a minimum road system in the project area.^{29 30}

- The Draft EA lacks adequate, workable, on-the-ground methods to deal with the spread of weeds and invasive plant species during the project's proposed actions (i.e. roadwork, logging, thinning, prescribed burns, etc.).
- The proposed amendment to change the old-growth definition fails to correct the large deficiency of existing old-growth in the project area or the BNF at large. The proposed amendment, in its current form, should not be pursued as part of this project. The claim contained in the Draft EA that logging/thinning old growth will "restore historical conditions" is ludicrous especially given apparent disagreement over what historical conditions were.

No management activities should be implemented in old growth. Recent studies have shown that old growth ecological systems (not just the trees) are the most complex and important feature of a forest. Areas of old growth should not be disturbed.³¹

The minimum number of Old Growth trees under Green et al. is too low for Flammulated Owls, a Montana Species of Concern and a U.S. Forest Service Sensitive Species. According to the Montana Field Guide, which references Linkhart and Reynolds 1997, "Territories consistently occupied by breeding pairs were those containing the largest portion (more than 75%) of old-growth (200 to 400 years), whereas territories occupied by unpaired males and rarely breeding pairs contained 27% to 68% old-growth."³²

Documentation from Gold Butterfly DEIS states, "historic logging dramatically reduced the amount of old growth in the Bitterroot drainage." Also, that the amount of old growth habitat that existed "prior to logging is not known." Recognizing those facts from previous project documentation, and for aesthetic, scientific, social and ecological reasons, we have consistently advocated that any activities conducted in what little old growth remains on the BNF preserve all the characteristics that make old growth special and unique for wildlife. The DEA's analysis for the need of the site specific amendment and discussion of old growth is narrowly framed from within the FS's tree-farming, manipulate-and-control world view, which has contributed to the situation where at least old-growth associated species—the fisher—no longer has a viable population on the Forest.

Please provide a detailed map of ground truthed old growth stands in and near the project area and where they overlap with clearcut focal areas, elk winter range, and IRAs in the project areas. The public understanding of old growth issue is also hampered

²⁹ Healey, S.P. (2020) Long-term forest health implications of roadlessness - <https://iopscience.iop.org/article/10.1088/1748-9326/aba031>

³⁰ Talty, M.J. et al. (2020) Conservation value of national forest roadless areas - <https://conbio.onlinelibrary.wiley.com/doi/10.1111/csp2.288>

³¹ Rapp, V. (2003) New findings about old-growth Forests - <https://www.fs.fed.us/pnw/pubs/science-update-4.pdf>

³² Montana Field Guide - <http://fieldguide.mt.gov/speciesDetail.aspx?elcode=ABNSB01020>

by the fact that there's no map in the DEA showing the analysis area being utilized for old growth, with the various Management Areas (MAs) and all existing old growth. Please also describe how the amendment reducing stand size to less than 40 acres will affect the distribution of old growth in the project area by MAs.

DEA at 72 states, the heave handed treatments proposed for old growth will "reduce competition and improve species composition while retaining the old growth characteristics as defined by Green et al (1992, errata corrected 2011)" and "increase resiliency and resistance to disturbances such as insects, disease, and fire. Indirectly, the removal of competing in-growth will improve the old growth stands resilience to future fire and insect disturbances compared to existing conditions." Please provide detailed analysis of existing conditions on the ground.

The agency is highly insincere and disingenuous. It is interested in growing trees more quickly for harvest, without all those pesky insects and tree diseases to contend with — not the kind of decadence characterized by trees in old growth which makes the habitat especially vital for so many wildlife species.

Please reconcile the need to remove this wildlife habitat dependent decadence with the following the following best available science concerning forests:

1. "(A)tttributes such as decadence, dead trees, ...are important..." (Green et al., 1992).
2. "Accumulations of large-size dead standing and fallen trees that are high relative to earlier stages." (Id.)
3. "Decadence in the form of broken or deformed tops or bole and root decay." (Id.)
4. "The big trees were subsidizing the young ones through the fungal networks. Without this helping hand, most of the seedlings wouldn't make it." (Suzanne Simard: <http://www.ecology.com/2012/10/08/trees-communicate/>)
5. "Disrupting network links by reducing diversity of mycorrhizal fungi... can reduce tree seedling survivorship or growth (Simard et al, 1997a; Teste et al., 2009), ultimately affecting recruitment of old-growth trees that provide habitat for cavity nesting birds and mammals and thus dispersed seed for future generations of trees." (Simard et al., 2013.) (Also see the YouTube video "Mother Tree" embedded within the Suzanne Simard "Trees Communicate" webpage at: <https://www.youtube.com/watch?v=-8SORM4dYG8&feature=youtu.be>) and also this one on the "Wood Wide Web" on Facebook: <https://www.facebook.com/BBCRadio4/videos/2037295016289614/>.
6. Gorzelak et al., 2015:
...found that the behavioural changes in ectomycorrhizal plants depend on environmental cues, the identity of the plant neighbour and the characteristics of the (mycorrhizal network). The hierarchical integration of this phenomenon with other biological networks at broader scales in

forest ecosystems, and the consequences we have observed when it is interrupted, indicate that underground “tree talk” is a foundational process in the complex adaptive nature of forest ecosystems.

The scientists involved in research on ectomycorrhizal networks have discovered connectedness, communication, and cooperation between trees, traditionally viewed as separate competing organisms. Such connectedness is usually studied within single organisms, such as the interconnections in humans among neurons, sense organs, glands, muscles, other organs, etc. necessary for individual survival. The tree farmers writing the Mud Creek DEA fails to consider the ecosystem impacts from industrial management activities on this mycorrhizal network—or even acknowledge they exist. The industrial forestry management paradigm destroys what it refuses to see.

The DEA refers to the lack of disturbance in old growth by fire as the need for the site specific amendment yet the FS uses an all-out fire suppression management strategy in the project area, and wants to suppress other natural disturbances such as insects, root diseases, and mistletoe which create important characteristics of old growth (Green et al., 1992). The DEAs mechanistic explanation of old growth is extremely irrational.

What is the purpose of the Forest Plan old growth standards? What is the scientific basis the FS relied upon for the percentages the Forest Plan sets as standards? Were those standard percentages based the range of historical conditions for old growth on the BNF?

Since old growth is partly an issue of maintaining viability of old-growth associated wildlife including Management Indicator Species (MIS) pileated woodpecker and pine marten, and viability is a forestwide issue, the FS must disclose forestwide compliance with percentage standards in all MAs forestwide for any claimed demonstration of viability to be meaningful. PF Wild 001 is a start, if the data are reliable, but it does not indicate how well old growth is currently distributed across the BNF and in each of the applicable MA units and how that will be affected by the amendment.

We are also concerned that the DEA is conflating old growth with “the over-mature tree component, as defined by size class” without providing a specific, quantitative definition of the latter, or the relationship between “over-mature tree component” and old-growth forests.

The DEA states that field reviews will occur during the implementation process. What is the guarantee that these will occur and project will be changed according to findings? What screening procedures will be used? How can the DEA justify a FONSI when this information has not been gathered? Without on the ground analysis, there is not sufficient analysis to justify the amendment.

Site specific amendment for old growth will change the minimum stand size for designating old growth? In other documents (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.)

Since old growth is likely below the historic range 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 old growth.

Defining characteristics of old growth described by Green et al., 1992 include:

Old growth forests encompass the late stages of stand development and are distinguished by old trees and related structural attributes. These attributes, such as tree size, canopy layers, snags, and down trees generally define forests that are in and old growth condition.

Definition

Old growth forests are ecosystems distinguished by old trees and related structural attributes. Old growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics which may include tree size, accumulations of large dead woody material, number of canopy layers, species composition, and ecosystem function.

(O)ld growth is typically distinguished from younger growth by several of the following attributes:

1. Large trees for species and site.
2. Wide variation in tree sizes and spacing.
3. Accumulations of large-size dead standing and fallen trees that are high relative to earlier stages.
4. Decadence in the form of broken or deformed tops or bole and root decay.
5. Multiple canopy layers
6. Canopy gaps and understory patchiness.

The Kootenai National Forest 1987 Forest Plan included Appendix 17 and other direction (USDA Forest Service 1987a). We incorporate that appendix as well as USDA Forest Service 1987b which contains a list of “species ...(which) find optimum habitat in the “old” successional stage...” Another Kootenai NF document (“Old Growth validation) 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.” We also incorporate an Idaho Panhandle NF forestwide old-growth planning document (USDA Forest Service, 1987d) and the original IPNF Forest Plan old-growth standards (USDA Forest Service, 1987c) because they provide biological information concerning old growth and old-growth associated wildlife species.

USDA Forest Service, 1987a states:

Richness in habitat translates into richness in wildlife. Roughly 58 wildlife species on the Kootenai (about 20 percent of the total) find optimum breeding or feeding conditions in the “old” successional stage, while other species select old growth stands to meet specific needs (e.g., thermal cover). Of this total, **five species are believed to have a strong preference for old growth and may even be dependent upon it for their long-term survival** (see Appendix I³³). While individual members or old growth associated species may be able to feed or reproduce outside of old growth stands, **biologists are concerned that viable populations of these species may not be maintained without an adequate amount of old growth habitat.**

Wildlife richness is only a part of the story. Floral species richness is also high, particularly for arboreal lichens, saprophytes, and various forms of fungus and rots. **Old growth stands are genetic reservoirs for some of these species, the value of which has probably yet to be determined.** (Bold emphases added.)

The DEA sets absolutely no diameter limit on trees to be cut in old growth. It would be consistent with the DEA if the FS were to log off some of the largest, oldest trees in the stand because they don’t meet the FS’s vague “desirable” criteria or might stand in the way of a proposed new road. As an aside, the DEA sets no diameter limits on logging any stand (not just old growth), instead making vague statements such as “larger trees will be retained where appropriate.” Given the habitat needs of wildlife in old growth and all areas of the forest, please explain when it is inappropriate to retain large trees. The Como project put a limit of 20 inches DBH for old growth stands and surrounding areas to recruit new old growth (Como ROD) Please explain why this is appropriate for the Como project but not appropriate for the Mud Creek project or the site specific amendment for old growth. The DEA goes on to say that monitoring for old growth effects and retention is occurring on the Como project and Gold Butterfly. Como project included size limits please explain how this monitoring will provide accurate results for Mud Creek with different specifications. If this monitoring includes the Lick Creek

³³ USDA Forest Service 1987b.

monitoring area please analyze the difference in basal area in that area and treatments proposed in Mud Creek. Gold Butterfly project is currently dropped and the Como project was completed less than 5 years ago. Certainly, it would take much more than 5-25 years to adequately analyze the effects of commercial logging of old growth and taking old growth stands to the minimum 8 trees per acre. When adequate information is available, old growth in Mud Creek will be lost for at least the next century.

Setting a scientifically based diameter limit such as 12" would allow areas not meeting old growth criteria to naturally develop old growth character as quickly as possible under natural processes.

Gautreaux, 1999 states:

...research in Idaho (Lesica 1995) of stands in Fire Group 4, estimated that over 37% of the dry Douglas-fir type was in an old growth structural stage (>200 years) prior to European settlement, approximately the mid 1800's.

Based on research of Fire Group 6 in northwest Montana (Lesica 1995) it was estimated that 34% of the moist Douglas-fir type was in an old growth structural stage (>200 yrs.) prior to European settlement, approximately the mid 1800's.

Based on fire history research in Fire Group 11 for northern Idaho and western Montana (Lesica, 1995) it was estimated that an average of 26% of the grand fir, cedar, and hemlock cover types were in an old growth structural stage prior to European settlement.

...fire history research in Fire Group 9 for northern Idaho and western Montana (Lesica, 1995) estimated that 19-37% of the moist lower subalpine cover types were in an old growth structural stage (trees > 200 yrs.) prior to European settlement. While this estimate is lower than suggested by Losensky's research...

Lesica found an estimated 18% of the cool lodgepole pine sites was in an old growth structural stage (>200 years) prior to European settlement, approximately the mid 1800's. ... This same research in Fire Group 8 in drier, lower subalpine types of Montana had over 25% of the stands in an old growth structural stage during the same historical period.

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

The Mud Creek DEA also does not properly analyze and disclose the natural historic range vs. current conditions regarding patch size, edge effect, and amount of interior forest old growth in the Bitterroot NF.

The FS has conducted no research or monitoring comparing pre- and post-logging old growth occupancy by or abundance of the wildlife species with strong biological association with habitat components found in old growth. Nor of the habitat you claim you have been “encouraging toward old growth conditions.” Biologically speaking, the FS refuses to check in with the real experts to see if logged old growth is still functioning as their habitat.

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

In Como project FEIS S2 they say that treating old growth and retaining it is a risk, “There is risk associated with treating old growth and being able to retain the old growth characteristics. Some research supports treating ponderosa pine old growth and retaining the old growth characteristics and there is a limited record of successful application. However, retaining old growth characteristics in mixed conifer old growth following treatment is more uncertain.” With so little old growth left in the project area, how will you retain old growth characteristics in Mud Creek beyond number of trees? CWD is an important characteristic, yet the DEA plans to amend CWD standards in the project area.

- The Draft EA documentation dealing with the cumulative impact of this, previous, and foreseeable future projects is inadequate. Given the current climate crisis and the President’s Executive Order (Tackling the Climate Crisis at Home and Abroad) to all federal agencies to enact climate-smart policies, this oversight is dangerous and astonishing almost to the point of entertainment.³⁴ Please provide analysis as to how all project specific amendments and the openings over 40 acres affect carbon sinks in the project area.

³⁴ Notice of Request for Public Comment on Executive Order on Tackling the Climate Crisis at Home and Abroad - <https://www.federalregister.gov/documents/2021/03/16/2021-05287/notice-of-request-for-public-comment-on-the-executive-order-on-tackling-the-climate-crisis-at-home>

DEA claims that “fire is the biggest ecological carbon source on the BNF”. Please use the best available science on carbon loss and fires to justify this statement including Mitchell et al 2009, Campbell et al 2011, and Cruetzburgetal 2014, among others . Please also include recent studies (Law et al 2018) in Oregon on the carbon loss from logging operations and consider fossil fuels combustion that will be necessary to drive these logs to Seeley Lake.

- Actually collaborate with the public. Make meaningful changes to the project based upon public comments (centered on science not politics).

DEA failed to adequately analyze public concerns and suggestions in concert. It did not consider their incorporation into an alternative that would fulfill the purpose and need. Instead, all suggestions were considered singularly. DEA 42-43

- The project should budget (and include) the funds required for post-project monitoring. Without monitoring, it is impossible to know whether management activities actually accomplish project goals. Information gathered during monitoring can and should be used to help in the design of future projects.
- The economic analysis of the project does not (but should) include project preparation costs, post-project monitoring, and the costs associated with reclamation and future maintenance.
- The project should include a thorough, in-depth analysis of its effects on the earth’s climate. Management activities associated with this project will require large amounts of fossil fuel. Recent research indicates that, on an annual basis, logging and thinning emit far more carbon than wildfire.³⁵ Other research shows that logged forests sequester less carbon than untreated forests.^{36 37} Any and all management activities which exacerbate climate change should be removed from the project unless they can be completely offset by including other activities which have been scientifically shown to mitigate global warming.

The FS’s position on project impacts on climate change is that the project would have a miniscule impact on global carbon emissions. The obvious problem with that viewpoint is, one can say the same thing about every source of carbon dioxide (and other anthropogenic greenhouse gas) emission on earth, and likewise justify inaction as does this DEA. In their comments on the Kootenai NF’s Draft EIS for the Lower Yaak, O'Brien, Sheep project, the EPA rejected that sort of analysis, basically because the scale of analysis dilutes cumulative effects. We would add that, if the FS wants to refer to a wider scope to analyze its carbon footprint, we suggest that it actually conduct such a cumulative effect analysis and disclose it in a NEPA document.

³⁵ Harris, N.L., et al. (2016) *ibid*.

³⁶ Campbell, J.L. et al. (2011) Can fuel-reduction treatments really increase forest carbon storage in the western US by reducing future fire emissions - <http://forestpolicy.com/wp-content/uploads/2011/12/campbell-2011.pdf>

³⁷ Wilson, N. et al. (2021) Comparing forest carbon stock losses between logging and wildfire in forests with contrasting responses to fire - <https://www.sciencedirect.com/science/article/abs/pii/S0378112720314705>

The Forest Plan does not provide meaningful direction on climate change. Nor does the Mud Creek DEA acknowledge pertinent and highly relevant best available science on climate change. This project is in violation of NEPA.

The Mud Creek DEA does not analyze or disclose the body of science that implicates logging activities as a contributor to reduced carbon stocks in forests and increases in greenhouse gas emissions. The DEA fails to provide estimates of the total amount of carbon dioxide (CO₂) or other greenhouse gas emissions caused by FS management actions and policies—forestwide, regionally, or nationally. Agency policymakers seem comfortable maintaining a position that they need not take any leadership on this issue, and obfuscate via this DEA to justify their failures.

The best scientific information strongly suggests that management that involves removal of trees and other biomass increases atmospheric CO₂. Unsurprisingly the Mud Creek DEA doesn't state that simple fact. The DEA fails to present any modeling of forest stands under different management scenarios. The FS should model the carbon flux over time for its proposed stand management scenarios and for the various types of vegetation cover found on the Bitterroot NF.

- Conditions based analysis relies heavily on design features to minimize the detrimental effects of project actions on soils, streams, ecological resources, bull trout, lynx, white bark pine, elk, rare plants, and all other flora and fauna in the project area. Design features are mentioned 54 times in the DEA alone. How will BNF guarantee that these design features will be followed? Are any of these design features dependent on future funding? What will be the consequences for not fulfilling the necessary design features to minimize effects to the forest?
- The DEA fails to consider and assess the reasonable alternative to the proposed actions. 40 CFR § 1500.2 "Federal agencies shall to the fullest extent possible: (e) Use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment;"
- "Implementing regeneration harvests up to 200 acres in size will contribute to landscape diversity, mimic natural disturbance patterns, and reduce fuel continuity. This will remove insect and disease affected stands prone to torching and crown fire behavior" (DEA 58), Has there been NEPA or other analysis concerning the identification of insect and disease affected stands? Please provide the analysis that shows insect and disease affected stands are prone to torching and crown fire behavior.

- For most resources considered in the DEA, there is limited or no analysis consistent with a determination of a FONSI. The DEA and specialist reports mention other reports where analysis allegedly appears but in itself, the DEA does not explain how it arrives at its determinations and conclusions, let alone disclose environmental impacts. The DEA fails to comply with NEPA's requirements to take a hard look so that the public or a decision maker can understand such impacts.
- DEA is unable to properly analyze and disclose cumulative impacts from past management and current management activities because monitoring information is incomplete or unavailable.
- The Mud Creek DEA cites few or no results of the monitoring required in the Forest Plan. Also, what Forest Plan Monitoring and Evaluation Reports have been published are in no way as frequent and detailed as the Forest Plan requires.
- There is apparently no connection between the Mud Creek project and what the FS should have learned from decades of monitoring required by the Forest Plan. A major purpose of Forest Plan monitoring is for the agency and public to be able to understand cumulative impacts of management activities and inform later management in an adaptive management paradigm. The lack of Forest Plan monitoring means the FS must compensate in project analyses, but from reviewing this DEA, that hasn't happened. A proper cumulative effects analysis would include:
 1. A list of all past projects (completed or ongoing) implemented in the proposed project area watersheds.
 2. A list of the monitoring commitments made in all previous NEPA documents covering the project area.
 3. The results of all that monitoring.
 4. A description of any monitoring, specified in those past project NEPA documents or the Forest Plan for proposed project area, which has yet to be gathered and/or reported.
 5. A summary of all monitoring done in the project area as a part of the Forest Plan monitoring and evaluation effort.
 6. A cumulative effects analysis which includes the results from the monitoring required by the Forest Plan.

The Mud Creek DEA fails to include an analysis of how well past projects met the goals, objectives, desired conditions, etc. stated in their respective NEPA documents, how well the projects conformed to forest plan standards and guidelines. It is informative for the public to know, in the NEPA process, if the impacts of past projects were correctly anticipated by their respective NEPA documents, and how well the statements of Purpose and Need in those NEPA documents were served.

Without such items being a part of the NEPA analysis, the validity of many of this DEA's statements and assumptions lack proper support. If predictions and analyses made in previous NEPA processes were inaccurate, and the agency is making similar decisions, then the process will fail. Also, if there have been problems with meeting past monitoring commitments, the DEA is wrong to rely on monitoring this time.

- The Mud Creek DEA does not cite any science to support its assumption that the FS management will result in snags and down logs in abundance to support viable populations. In fact it proposes site specific amendments for Coarse Woody Debris (CWD) and thermal cover.

No monitoring is cited to support the DEA claims of the benefits of these amendments to snag and down log-dependent species' population numbers or distribution. No estimates of snags for the project area state how statistically robust the project area surveys are for making accurate estimates and analyses.

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

- 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).
- DEA 102 states, "The vegetation treatments, transportation improvements, and watershed activities are likely to directly affect the pine marten and pileated woodpecker/" It goes on to say that treatment in old growth, coarse woody debris deficits, loss of snags, and large openings that violate the forest plan would displace martens and pileated woodpeckers and other species that select for complex habitat. The project is ongoing for 20 years and in concert with the Piquett Creek project. How will these animals find suitable habitat during project implementation and until areas are healed and what pressure will it put on all species in the project area?

In terms of “quality of habitat” the fragmentation of the Bitterroot NF 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. ...In 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.

- Excessive roads in the project area and effects on bull trout and aquatics

Damage caused by road construction, re-construction and current conditions in the project area that are causing sediment in already impaired streams are to be improved and mitigated with BMPs, proper maintenance and various culvert actions. The problem with this approach is—implementing Best Management Practices (BMPs) and other drainage improvements are short-lived, and after a few short years the situation reverts back to what it is now—insufficient maintenance funding resulting in chronic watershed damage. This fact is ignored in the DEA. Table 12 and 13 show sediment results if “BMPs are applied and maintained.” (DEA 50-51). It does not show sediment results over time if BMPs are not properly maintained nor does it address the ongoing and future backlog of maintenance on the BNF. The same tables do show that previous maintenance has been lax if not non-existent.

Models used for analysis in the DEA are insufficient and do not address sediment risks due to log hauling and other project activities to aquatics and bull trout, westslope cutthroat trout and pearlshell mussels. USDA Forest Service, 2016b 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.

Yet the DEA merely claims that sediment “possibly from log hauling” (DEA at 52 and 53 and 54) could affect impaired streams and Bull Trout and endangered species. Failing to analyze

the effects of log hauling on impaired streams that are habitat to bull trout is a violation of the ESA.

DEA at 48 states that bull trout are on the decline due to rising stream temperatures. It states, "If and when streams are burned at high severity, the speed and magnitude of the temperature increases, and the fish community changes are likely to be accelerated and more pronounced." The DEA analyzes the possibility of fire on declining fish populations but fails to analyze project activities on bull trout and other sensitive species. DEA implies that as long as design features are followed and BMPs are applied and maintained correctly, bull trout will not be affected by logging activities. This shows how incomplete the analysis is. Aquatics monitoring of prescribed burns and stream sedimentation are not complete and do not take into consideration that cool weather burning breaks down soil over time causing erosion and loss of vegetation. Spring burning also kills native grass forbs allowing for erosion.

DEA at 52 states, "In the Nez Perce Fork and Rombo Creek, hauling may deliver small amounts of sediment into bull trout spawning and rearing habitats that the U.S. Fish and Wildlife Service considers to be in adverse condition (functioning at unacceptable risk) for sediment and substrate embeddedness. The affected reaches are: (1) the portion of the Nez Perce Fork between Two and Flat creeks (a 3.2 mile section of spawning and rearing habitat that is designated as critical habitat); and (2) the Bitterroot NF portion of Rombo Creek (a 2.5 mile long section of spawning and rearing habitat that is not designated as critical habitat). Again the EA concludes that log hauling will have little effect on sediment in streams assumes that BMPs will be maintained regardless of FS budget. EA also does not analyze the effects of applying BMPs.

For one Rombo creek, an impaired stream with bull trout, DEA states that effects would be non-significant because "The effects would be short-term, limited to a small area (about 1,000 feet of stream), affect low numbers (< 20) of bull trout, and be created largely by an activity (removal of a culvert barrier) that would provide long-term benefits to the population". Again log hauling and later road traffic would have no effect because BMPs will be maintained.

Please use the best available science to analyze the effects of log hauling, prescribed burning, the loss of snags, lack of CWD standards, low canopy percentages and expected poor road maintenance based on past history and budget on bull trout.

Please analyze the cumulative effects to Bull Trout and other sensitive aquatic species from project activities Piquett Creek, past NEPA burning and piling included with Piquett Creek Project (Lower West Fork, TSI projects et al), and the aquatic organism passages on system roads in the project area awaiting funding DEA 9.

Please also analyze the effects of erosion and water quantity from changes to flooding due to logging operations (Green and Alila 2012)

Please include analysis of erosion from 3 new ATV loop trail traffic and increased truck and trailer travel to the parking area on aquatics and related species.

The roads analysis and affects on streams in the DEA do not take in to account the constant poaching of closed and administrative roads as well as illegal off-roading that is rampant on the BNF. How will the temporary and new roads as well as existing roads contribute to sediment in streams.

Without the sufficient funding to maintain its road system in a timely manner, all the BMP implantation that can be mustered in the context of a project such as this will only be a short-term fix, and the road system will remain an ecological liability. 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. (Emphasis added.)

The DEA fails to recognize that “continual monitoring and maintenance” is necessary following project completion. The DEA fails to disclose the temporal effectiveness or non-effectiveness of all the road maintenance and upgrading, merely assuming that the proposed actions will forever mitigate the problems they now exhibit. It fails to properly analyze and disclose the impacts of its continuously failing, undermaintained road system.

The FS has been, and under this project would continue to manage the project area inconsistent with Forest Plan Road System Standards, in violation of NFMA. These include:

- Roads will be maintained to design standards.
- Roads will be closed to public use if adequate road maintenance funds are not available.

Since the DEA includes no alternative to bring the FS into compliance with the above standards, it violates NEPA.

We appreciate that road decommissioning is proposed. However, the DEA does not analyze how specific road decommissioning will affect ongoing sediment inputs to streams. Nor is there discussion on how these roads would be accomplished. How many of these decommissioned roads will actually change sediment inputs to streams? Again road decommissioning is dependent on future funding as is much of the BNF road system requiring maintenance.

Again, the DEA fails to identify the minimum road system. The Travel Management Regulations Subpart A requires a science-based Travel Analysis Process identify the minimum road system. Identifying the minimum road system would guarantee all roads would receive

timely, proper maintenance after project completion in recognition there is no increase in regular road maintenance dollars foreseeable.

The DEA does not demonstrate the project area is being managed consistent with Travel Management Regulations. The Travel Management Regulations (36 CFR 212) Subpart A requires the FS to identify the minimum road system needed to manage the Forest sustainably. The DEA does not demonstrate how it is minimizing the forestwide road system in compliance with the Travel Management Regulations and related Directives.

The main ecological and financial problem facing the Bitterroot NF, and national forests throughout the Inland Northwest and U. S. Northern Rocky Mountains, is the existing excessive network of roads. Although the main focus of the Travel Management Rule Subpart A was to be this excessive road network, the FS sidesteps the issue at every juncture—in site specific amendments, in the design of projects, and in the systematic avoidance of conducting its duties under Subpart A, which requires the agency to minimize the ecological and economic liabilities of the excessive road network by significantly downsizing it.

The Mud Creek DEA does not present the proper economic or financial analysis to allow anyone to understand how well or how deficiently all the post-project system roads will be maintained, in light of the well-demonstrated inadequacy of annual appropriations or other funding sources. Therefore, it is impossible to discern the resultant ecological damage from putting watersheds in a “press” type condition which can never recover largely because of insufficient road maintenance.

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)

Roads influence many processes that affect aquatic ecosystems and fish: human behavior (poaching, debris removal, efficiency of access for logging, mining, or grazing, illegal species introductions), sediment delivery, and flow alterations (Trombulak and Frissell 2000). (Also see: Gucinski et al. 2001; Wisdom et al., 2000; Pacific Rivers Council, 2010.) We also incorporate The Wilderness Society (2014) which discusses best available science on the ecological impacts of roads.

The Mud Creek DEA does not consider the fact that roads increase the efficiency of water transport during storm or snowmelt events, elevating water yields well above natural, with damaging effects. The DEA ignores water yield as a factor, without explanation. FS hydrologist

Johnson 1995 discusses many forms of road-related and other cumulative impacts the DEA fails to consider.

Frissell, 2014 states:

Roads are ecologically problematic in any environment because they affect biota, water quality, and a suite of biophysical processes through many physical, chemical, and biological pathways (Trombulak and Frissell 2000, Jones et al. 2000). The inherent contribution of forest roads to nonpoint source pollution (in particular sediment but also nutrients) to streams, coupled with the extensive occurrence of forest roads directly adjacent to streams through large portions of the range of bull trout in the coterminous US, adversely affects water quality in streams to a degree that is directly harmful to bull trout and their prey. This impairment occurs on a widespread and sustained basis; runoff from roads may be episodic and associated with annual high rainfall or snowmelt events, but once delivered to streams, sediment and associated pollutant deposited on the streambed causes sustained impairment of habitat for salmon and other sensitive aquatic and amphibian species. Current road design, management of road use and conditions, the locations of roads relative to slopes and water bodies, and the overall density of roads throughout most of the Pacific Northwest all contribute materially to this impairment. This effect is apart from, but contributes additively in effect to the point source pollution associated with road runoff that is entrained by culverts or ditches before being discharged to natural waters.

The FS touts management projects as “restoration,” but such claims are mostly overhyped because of their primary focus on “vegetation” (i.e., logging) misses what really needs restorative action—the overbuilt road system. Wisdom et al., 2000 point out issues the Bitterroot NF wants to ignore:

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.) So we have a situation where the Bitterroot NF continuously and programmatically promotes “restoration” without acknowledging the major source of ecological damage—its excessive and failing road network.

Have all changes to Forest roads, trails, and over-snow (winter) access authorized under the Bitterroot National Forest Travel Management Planning Project Record of Decision been implemented? If not, please disclose what actions are yet to occur, and a timeline.

More on BMPs. The FS relies heavily upon BMP to address the issues associated with logging roads (again, only within a project context). 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). Stanford and Ward (1993) termed this phenomenon the “illusion of technique.”

The Mud Creek DEA does not analyze or disclose the project area road system’s needed long-term financial investments, nor the associated ecological impacts due to inadequate maintenance funding. The DEA rests on the assumption that this project will adequately mitigate the problems chronically posed by the road network by project road work and BMP implementation, despite the fact that FS officials are aware this is not the case (USDA Forest Service, 2010t, Lolo National Forest, 1999).

Have all changes to Forest roads identified in the forestwide Travel Analysis Report been implemented? If not, please disclose what actions are yet to occur, and a timeline.

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 Mud Creek DEA does not disclose the Project Area Road Management Objectives, which were to be developed using the Travel Management Regulations and how and when these objectives will be implemented.

The Mud Creek DEA does not incorporate the required science-based transportation analysis, and so there was no assessment that comprehensively identified the unneeded or most damaging roads. The process the FS used is not consistent with requirements to involve the public in a science-based Travel Analysis Process, create a Travel Analysis Report, and identify roads likely not needed to manage the forest, as required under the Regulations and in the Directives. The DEA does not state how the Mud Creek project might or might not be implementing the forestwide minimum road system.

Does the FS maintain that the Mud Creek decision will be consistent with the Travel Management Regulations (36 CFR 212) Subpart A?

Scientific information from government studies conducted for the Interior Columbia Ecosystem Management Project reveals a highly negative correlation between road density and fish habitat conditions. USDA Forest Service & USDI Bureau of Land Management, 1996a state:

High integrity [forests] contain the greatest proportion of high forest, aquatic, and hydrologic integrity of all [] are dominated by wilderness and CLIMATE areas [and] are the least altered by management. [] Low integrity [forests have] likely been altered by past management [] are extensively roaded and have little wilderness. (Pp. 108, 115 and 116).

And USDA Forest Service & USDI Bureau of Land Management (1996) state “Increasing road density is correlated with declining aquatic habitat conditions and aquatic integrity. [] An intensive review of the literature concludes that increases in sedimentation [of streams] are unavoidable even using the most cautious roading methods.” (P. 105).

The Mud Creek does not disclose if the FS has surveyed the project area with the detail needed to determine if all non-system roads existing in the project area have been

identified, so their ecological liabilities can be accounted for especially their effects on Bull Trout.

We incorporate the Amended Complaint for case CV-18-67-DWM for the purposes of explaining how roads affect wildlife and how widespread are the ineffective closures on national forest land.

- Wildlife viability

The FS fails to set meaningful thresholds and assumes without scientific basis that project-caused habitat losses will not threaten to population viability. Of such analyses, Schultz (2010) concludes that “the lack of management thresholds allows small portions of habitat to be eliminated incrementally without any signal when the loss of habitat might constitute a significant cumulative impact.” In the absence of meaningful thresholds of habitat loss and no monitoring of wildlife populations at the Forest level, projects will continue to degrade habitat across the Bitterroot NF over time. (See also Schultz 2012.)

Assuring viability of most wildlife species is forestwide issue. The cumulative effects of carrying out multiple projects simultaneously across a national forest makes it imperative that population viability be assessed at least at the forestwide scale (Marcot and Murphy, 1992; also see Ruggiero et al., 1994a).

Please provide proper analysis of project caused habitat losses and their effects on population pressure and viability. Please follow best available science to determine population thresholds.

Please also analyze effects of fuel reduction treatments vs clumping as recommended by Andrew Larsen on wildlife and habitat.

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

Canada Lynx (Threatened):

The Mud Creek project would impact Lynx Analysis Units (LAUs). The DEA does not include an analysis comparing the historic range of lynx habitat components with present conditions.

The Mud Creek DEA does not apply the best available science regarding the Canada lynx. The Project will result in unauthorized take under Section 9 of the ESA. The FS has duties under the ESA, 16 U.S.C. Section 1531 *et seq.*, to ensure that its actions do not jeopardize threatened and endangered species, that their actions do not result in

unauthorized take of these species of wildlife, and that their actions promote recovery of these species.

A big problem with the Forest Plan/NRLMD Amendment is that they allow essentially the same level of industrial forest management activities which occurred prior to Canada lynx listing under the Endangered Species Act (ESA). With the Gold Butterfly timber sale, the FS continues failure to consider, apply, and incorporate best available science; fails to demonstrate consistency with all Forest Plan/NRLMD direction, and will adversely modify lynx critical habitat in violation of the Endangered Species Act (ESA). The project will result in unauthorized take as defined by Section 9 of the ESA.

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. Yet the project specific amendment to thermal and hiding cover will affect snowshoe hare in the project area and subsequently lynx. Please provide analysis that demonstrates otherwise.

Please analyze how large openings and uneven aged management will affect lynx travel and travel habitat throughout the year and especially during winter and early spring. Existing openings such as clearcuts not yet recovered are likely to be avoided by lynx in the winter. (Squires et al. 2010; Squires et al. 2006a) 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. to avoid sparse, open forests and forest stands dominated by small-diameter trees during the winter.

How will the project actions affect lynx reproductive success and the female population? Kosterman, 2014 finds 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.

DEA seems to state that project actions other than regeneration logging and some intermediate cuts will have little effect on lynx. 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.) Please explain how EA conclusions align with this research.

Using best available science please analyze and explain FS and DEA assumption that clearcutting/regeneration logging have the same temporal effects as stand-replacing fire as far as lynx re-occupancy.

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 for landscape connectivity should be maintained to allow for movement and dispersal of lynx. Lynx avoid forest openings at small scales, however effects on connectivity from project-created or cumulative openings were not analyzed in terms of this smaller landscape scale. And connectivity between project area LAUs and adjacent LAUs was not analyzed or disclosed.

DEA fails to analyze and disclose how much of the Project area would be affected by snowmobiles and other recreational activities. EA does not analyze the effects of winter recreation and other forest uses on lynx. Nor does it analyze new ATV loop trails and “other opportunities” that could be proposed during implementation.

As roads will provide access for trappers, How will the increased trapping season, snaring and large leg traps affect lynx in the project area?

Grizzly Bears (Endangered)

The projects proposed 20 year duration is a violation of NEPA because changes can occur in the project area during that time. Grizzly bears are one example. The project area is a vital linkage zone for the Bitterroot Recovery area from the GYE. If grizzly bears are not using the project area already, it is highly probable that they will be in the next five years.

The DEA states there are no grizzlies in the area but also says contractors and personnel will be instructed to report any encounters (DEA Appendix B at 37). This implies that FS expects to see bears in the area during the project. There have been 5 verified grizzly bear sightings only about 10 miles east of the Mud Creek Project (verified since 2005) and 2 possible sightings since 2011. It is clearly possible that grizzly bears are also present in the Mud Creek landscape or will be soon.

Logging stands with whitebark pine in them, besides directly killing a species proposed for listing under the Endangered Species Act (ESA), is a direct adverse impact on grizzly bears. This direct adverse impact needs to be identified in a biological assessment and biological opinion on project impacts to the grizzly bear,

Since this is a 20-year project, how is the agency going to evaluate project area occupancy by grizzly bears for this time period? In addition, how can the U.S. Fish and Wildlife Service (FWS) make any findings of possible adverse impacts of this 20-year project?

Red squirrels make whitebark pine nuts available to grizzly bears. The removal of white bark pine, the amendment to CWD, and the amendment to thermal cover will directly affect red squirrels. This is not analyzed in the EA.

There is no analysis in the Mud Creek DEA as to how motorized road and trail use would impact grizzly bears. The agency needs to define what the open and total motorized route density will be in the 4 sub-project areas over each of the next 20 years, or at least during each 5-year time period required by the NEPA. Also, the agency needs to define how these road densities during the 20 years of project implementation will compare to the Montana Fish, Wildlife and Parks (MFWP) recommendation that open road density in occupied grizzly bear habitat be limited to no more than one mile per section. Where will security areas be provided for this time frame? The expected illegal motorized use needs to be considered in this analysis as well. How will the increased trapping season, snaring and large leg traps affect grizzlies in the project area?

Wolverine (Sensitive: listing proposal is currently under litigation)

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

Please analyze the effects of project actions on this species including the targeting of Doug Firs and Lodgepole pines in the proposed treatment cards. Wolverine habitat has contracted in the US. How will this project, its site specific amendments, and its exceedingly large amendments affect wolverine and the decline in suitable habitat. Please analyze the effects of roads including temporary roads for their time on the landscape while awaiting funding for obliteration and on Wolverine. How will the project change access for trappers and recreationists in the project area also considering increased trapping seasons on wolverine? Please provide information on the quantity and quality of habitat necessary for wolverine as well as the cumulative effects of recreational activity on wolverine.

Please use the best available science to explain how the high density of roads in the area and increasing those roads during project implementation of 20 years will affect all Endangered, Sensitive species and management indicator species.

Fisher (Sensitive)

Please provide a thorough analysis of post-management vs pre-management baseline habitat for Fisher. Also provide analysis of cumulative effects on fisher due to trapper and recreational access including the increased trapping season. Please analyze the effects of logging and trapping pressure on fisher vulnerability.

The analysis for the fisher, as for most wildlife, doesn't disclose the direct, indirect or cumulative impacts on important habitat components, such as snags, logs, foraging habitat configuration, connectivity, cover, prey species impacts, etc. especially with changes to CWD and thermal cover standards.

Please disclose the FS strategy and best available science for insuring viable populations of fisher, including limiting human access and trapping. The DEA cites no scientifically-based analysis on the spatial and structural requirements for fisher survival and successful reproduction. There is no sound, scientifically-based analysis for the Forest Plan or entire Forest comparing forestwide conditions with habitat metrics required to insure fisher viability. The analyses for other wildlife show these same flaws.

Pine Marten (Management Indicator Species)

The Mud Creek DEA fails to consider best available science for insuring viable populations of the pine marten, a species whose habitat is significantly altered by thinning and other active forest management. (See Moriarty et al., 2016; Bull and Blumton, 1999; Hargis et al., 1999 and Wasserman et al., 2012).

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

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

Old growth is essential to martens please disclose analysis using the best available science how using only tree numbers in Green et al will affect marten habitat. The DEA does not disclose the quantity and quality of habitat necessary to sustain the viability of the marten.

Pileated Woodpecker (Management Indicator Species)

DEA recognized that Pileated Woodpeckers will be displaced by management activities.

Indirect effects to pileated woodpeckers may occur in the form of habitat alterations. Treatments that reduce canopy cover below 10% or the loss of large snags and coarse wood may render areas temporarily unsuitable. Larger openings (greater than 40 acres) in stands affected by insect disturbance would reduce foraging habitat for pileated woodpeckers. Prescribed fire would provide additional feeding and nesting habitat by promoting large diameter, open stands and producing new snags, which would be beneficial. (EA at 102-103)

The DEA does not divulge how long the “temporary” effect will last nor does it take into consideration the effects of the CWD amendment across the project area to pileated woodpeckers. Please disclose the FS strategy and best available science for insuring viable populations of pileated woodpeckers.

The Idaho Panhandle NF’s Forest Plan’s 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, provide field tested management guidelines. They recommend that approximately 25% of the home range be old growth and 50% be mature forest.

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

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

Please be more specific about how project activities will affect these habitat attributes.

The pileated woodpecker’s strong preference for trees of rather large diameter is not adequately considered in the Forest Plan or DEA. The FS provides absolutely no commitments for leaving specific numbers and sizes of largest trees favored by so many wildlife species.

What is the scientific basis the FS relied upon for the Forest Plan snag retention guidelines? Were those guidelines based the range of historical conditions for snags on the BNF?

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.” Yet the DEA at 103 claims that prescribed fires will be beneficial to pileated woodpeckers, “Prescribed fire would provide additional feeding and nesting habitat by promoting large diameter, open stands and producing new snags, which would be beneficial.” Please explain the discrepancy between DEA claims and Vizcarra 2017.

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). Considering the best available science, please explain why

there is no diameter limit on treatments in the project area and in old growth. We would recommend using 16dbh to insure future large diameter trees.

The DEA fails to quantify the cumulative snag loss in previously logged areas and other management caused activities such as road accessed firewood cutting. Snag loss along roads and during management activities due to hazard should also be analyzed.

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

Black-Backed Woodpecker (Sensitive)

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

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

Contrary to what one might expect to find immediately after a major disturbance event, I detected a large number of species in forests that had undergone stand-replacement fires. Huff et al. (1985) also noted that the density and diversity of bird species in one- to two-year-old burned forests in the Olympic Mountains, Washington, **were as great as adjacent old-growth forests...**

...Several bird species seem to be relatively **restricted** in distribution to early post-fire conditions... I believe it would be difficult to find a forest-bird species more restricted to a single vegetation cover type in the northern Rockies than the Black-backed Woodpecker is to early [first 6 years] post-fire conditions. (Emphasis added).

USDA Forest Service 2011c states:

Hutto (2008), in a study of bird use of habitats burned in the 2003 fires in northwest Montana, found that within burned forests, there was one variable that exerts an influence that outstrips the influence of any other variable on the distribution of birds, and that is fire severity. Some species, including the black-backed woodpecker, were relatively abundant only in the high-severity patches. . **Hutto’s preliminary results also suggested burned forests that were harvested fairly intensively (seed tree cuts, shelterwood cuts) within a decade or two prior to the fires of 2003 were much less**

suitable as post-fire forests to the black-backed woodpecker and other fire dependent bird species. Even forests that were harvested more selectively within a decade or two prior to fire were less likely to be occupied by black-backed woodpeckers. (Emphasis added.)

Also see the agency's Fire Science Brief, 2009, which states, "Hutto found that Black-backed Woodpeckers fared best on sites unharvested before fire and poorest in the heavily harvested sites", raising a concern about logging for forest restoration that is not addressed in the Mud Creek EA. How does pre-fire logging affect the future suitability of these forests to post-disturbance specialists?

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.)

The FS seems to ignore this research as it continues to manage against severely burned forests, as evident from the Mud Creeks Purpose and Need.

Please analyze the loss of the black backed woodpecker due to continued fire suppression and the effect on secondary cavity nesting birds and all parts of the ecosystem that rely on them.

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.

The viability of black-backed woodpeckers is threatened by the FS's 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 Mud Creek project is to negate the natural occurrence 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. This emphasis also occurs on a large portion of the Bitterroot NF. Viability of a species cannot be assured, if habitat suppression is a forestwide policy.

Please disclose the quantity and quality of habitat that is necessary to sustain the viability of the black-backed woodpecker and how project activities and its purpose and need will affect that habitat.

Please disclose the quantity and quality of habitat that is necessary to sustain the viability of flammulated owls, and bighorn sheep how project activities will add or detract from it.

- Soils

The DEA states, “The Bitterroot National Forest has a long history of soil monitoring of commercial harvest activities to assure compliance with soil law and policies (PF-SOILS-006).” (p.87) What we did not see disclosed is that much of that monitoring shows soil compaction to be widespread and very long-lasting on the BNF. Prior to about 2005 the BNF Soil Scientist’s monitoring research design and documentation were extremely professional. Instrumentation was used to validate and calibrate the usual subjective soil compaction measurements. His work was thoroughly peer-reviewed. His credentials and ethic led to him being leader of a Region 1 Soil Monitoring Task Force. His findings regarding existing damage to the foundation of the BNF productivity - the soils, are swept under the rug, undisclosed, in the Mud Creek Project DEA, but the evidence is on the land and can’t be just swept away.

Compare monitoring results prior to 2005 with results from recent years. BNF soils monitoring in preparation for recent timber sales have found remarkably less existing soil damage than was found up to about 2005. Please disclose if soils are naturally recovering more quickly than before. Have you validated the effectiveness of your overly optimistic estimates of subsoiling treatments?

The new, untested soil monitoring protocol described in the DEA Project File is the very definition of labyrinthian. In combination with the enigmatic conditions-based NEPA process it becomes meaningless to the public.

“The Bitterroot National Forest has developed a Soil Risk Evaluation Framework (SREF) to aide in adaptive management of the Mud Creek Proposed Action (see PF-SOILS-001 pages 3-5). The SREF approach uses proxy measurements of soil-water retention to determine soil resiliency in the project area (PF-SOILS-008 this measure is combined with previous forest activity (FACTS) data and previous soil disturbance monitoring data to provide a

communication and analysis tool for soil resources in a condition-based treatment approach.” (p. 87) Please provide validation monitoring and science-based references to support your incredibly convoluted approach.

The SREF says, “For example, if a proposed project activity occurs within an area with high soil resilience and has documented past activities, the soil risk category falls within level “C,” which requires a survey of existing soil DSD prior to implementation and application of appropriate design features.” (PF-Soils-001, p3) In fact all cutting units must be surveyed on the ground before logging.

PF-Soils-001 language suggests cutting units may not be surveyed on the ground as indicated by the following language:

“The proposed treatment units identified for field review within the SREF framework will utilize detrimental soil disturbance walkthrough surveys and traverses following the

Forest Soil Disturbance Monitoring Protocol. Units will be surveyed based on the Soil Risk Category (SRC) guidance outlined in Table S3.”

“*Pre-project DSD or CWD soil surveys in units are only needed if the layout crew or other resource special survey identifies:

- past disturbance (such as excavated skid trails, tree stumps or persistent fire consumed
- CWD, high severity fire effects) covers greater than 15% of the unit; and/or recent (< 10 years) high severity fire covers greater than 15% of the unit; and/or lack of CWD.”

“Soil inventory of persisting detrimental soil disturbance may be required within these project areas.”

We are particularly alarmed by the following loophole: “*If the layout crew or other resource specialist survey does not identify lack of CWD and/or evidence of past management (such as excavated skid trails, tree stumps or persistent fire consumed CWD, high severity fire effects), no soil inventory in units is needed.” Layout crews are not trained observers of soil damage. Like the FS in general, they focus on trees.

Leaving the foundation of forest productivity uninspected prior to logging or burning is reckless.

Soil compaction is widespread across the BNF according to past monitoring, even discounting the soil compaction of the widespread road system, which is routinely discounted. The hydrologic effects of soil compaction, within the cutting unit as well as on roads, can accumulate downstream beyond the cutting unit causing a variety of issues including increases in high flows and advancement in timing of low flows. Too much

increase in high flows can cause streambank instability. ECA, equivalent clearcut area, is one measurement that indicates when streambank instability threshold is being reached. What are the ECAs of the drainages within the project area and what will they be after the project? We can not tell what they will be afterwards because we don't know where what activity will be done.

As indicated above, the following statement in the DEA is misleading: "Assessment of cumulative effects on soil quality and organic matter at scales larger than the specific treatment unit boundary (such as the watershed scale) Mud Creek Project Environmental Assessment misrepresents the effects of management activities by diluting the site-specific effects across a larger area. As such, this analysis will apply the 15% DSD soil resource indicator at the same scale as it is traditionally used under "unit-based" NEPA analyses." (DEA, p 89,90) Such an approach is appropriate for cutting units but unnecessarily and carelessly misses the bigger picture regarding accumulating hydrologic impacts as well as overall forest productivity.

According to the Forest Plan Standard for soils you must, "Utilize equivalent road area or similar concept to evaluate cumulative effects of projects involving significant vegetation removal, prior to including them on implementation schedules." (FP, pII-23) Please disclose the total acreage of all existing as well as planned roads, of whatever nomenclature, within the project area so we can assess total soil compaction within the project area.

The DEA discloses, "Some soils in the project area have reduced soils quality due to DSD that occurred over 60 years ago."

Suggesting it may be time for additional soil damage the DEA cheerily announces, "Based on existing field surveys in and around the project area, most soils in previously disturbed areas that were implemented during the 1960's are recovering." (p.89) It is an ecological truism that once damaging activity stops natural healing can begin.

"Terraced plantations: The Mud Creek project area contains 79 terraces plantations ranging in size from 1 acre to 130 acres and totally approximately 1,645 acres." (Mud Creek scoping letter). The former BNF soil scientist consistently measured detrimental soil damage in terraced plantations at 90% or greater, far above the 15% limit.

The implementation approach delays monitoring of existing soil damage until long after the Decision is final and there is nothing the public can do to protect the soils but to trust the accuracy, professionalism and transparency of the monitoring. We are dubious.

Appendix A Design Features, Sub Soiling; TRM-08, says subsoiling does not mix soil horizons. Please substantiate this with scientific reports and monitoring results.

What is the percentage effectiveness of subsoiling in terms of returning the soil to original function and productivity? Please disclose science and monitoring results. Subsoiling cannot be expected to be 100% effective.

Coarse Woody Debris (CWD) is defined by the BNF as greater than 3 inches in diameter. The requirement to maintain various levels of CWD can be met by maintaining smaller pieces like branches while eliminating the longer-term supply of soil organic matter of larger material. There is far more ecological value and less fire danger from downed 3- foot logs than there is from branches.

Please disclose results of monitoring weed control after past projects have been completed. It is apparent that after every timber and road building project weeds follow and proliferate, essentially reducing forest productivity in perpetuity, contrary to NFMA.

Soil monitoring results from past NEPA analysis of former project areas within the Mud Creek project area should be disclosed in Mud Creek NEPA documents prior to a Record of Decision

It is not clear how the DEA map of past harvest activities with existing soil impacts within the Mud Creek Project Area overlaps with the Mud Creek project because specific activity units have not been delineated.

- Forests (“vegetation”) and resilience.

The FS’s strategy to strive towards desired conditions focuses on achieving static conditions, instead of fostering the natural dynamic characteristics of ecosystems. An abundance of scientific evidence indicates the DEA’s static desired conditions must be rejected in favor of desired future dynamics to align with best available science. FS researcher Everett (1994) states, “To prevent loss of future options we need to simultaneously **reestablish ecosystem processes and disturbance effects that create and maintain desired sustainable ecosystems**, while conserving genetic, species, community, and landscape diversity and long-term site productivity.” (Emphasis added.) Hessburg and Agee 2003 also emphasize the primacy of natural processes for management purposes:

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

Collins and Stephens (2007) suggest direction to implement restoring the process of wildland fire by educating the public, which means explaining the inevitability of wildland fire, teaching about fire ecology, and identifying landowners’ primary responsibility for protecting their properties. Not surprisingly, since proper education conflicts with the FS’s

manipulate-and control management paradigm, we don't see it in the Mud Creek DEA though education about the benefits of fire is a part of the BNF Forest Plan.

The DEA provides no explicit plan disclosing the details on how a restored landscape would be sustained. In other words, how often treatments will occur, how extensive they need to be, which kinds of treatments will be necessary, how many miles of roads will be needed (both permanent and temporary), etc. This means we cannot know how many acres at any given time will be suffering reduced productivity because of soil damage or infested by noxious weeds, or how many acres of wildlife will be subject to diversity impacts due to snag losses due to logger safety or firewood cutting. Also missing is an economic analysis in the DEA, which would disclose how much managing for this regime will cost on a continuing basis—and therefore how likely such a plan could actually be implemented in order to achieve or maintain the “restored” (under the FS definition) vegetation conditions. Sallabanks et al., 2001 state:

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

The DEA fails to consider scientific information that provides a better alternative to the FS's management paradigm.

The Mud Creek DEA assumes that if natural fire regimes were operating here practically all the low and mid-elevation forests would be in open conditions with widely spaced mature and old trees—mostly ponderosa pine with a few Douglas-fir. The FS fails to acknowledge good science, such as 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 DEA's assertion that the proposed treatments will result in predictable wildland fire effects is of considerable scientific doubt (Rhodes and Baker, 2008), which the FS fails to acknowledge.

- Scientific Integrity

Agency expert opinion and gray literature relied upon in the Mud Creek DEA is not necessarily the same as “the best scientific information” available. Sullivan et al., 2006 discuss the concept of best available science in the context of politically influenced management:

Often, scientific and political communities differ in their definition of best available science and opposing factions misrepresent the concept to support particular ideological positions. Ideally, each policy decision would include all the relevant facts and all parties would be fully aware of the consequences of a decision. But economic, social, and scientific limitations often force decisions to be based on limited scientific information, leaving policymaking open to uncertainty.

The DEA does not conform to NEPA because the FS has not insured the reliability of data relied upon by the models, and the FS has not validated the models for the way the Mud Creek DEA utilizes them. The Ninth Circuit Court of Appeals has declared that the FS must disclose the limitations of its models in order to comply with NEPA. However, the DEA has failed to disclose these limitations.

The Mud Creek DEA violates NEPA because the FS has not insured the professional and scientific integrity of its analyses.

- Please disclose to the public how the NEPA process will go forward after the Mud Ck EA comment deadline. At what point in the conditions based process will the final administrative remedy be exhausted?
- How can the USFWS adequately address the need for consultation when they are required to analyze the full scope of the agency action including all foreseeable activities of this multi-stage project and yet the foreseeable activities have not been disclosed?

- Ubiquitous Project Specific Forest Plan Amendments

The continuously expanding patchwork of various “project specific” amendments has not been subjected to any cumulative impacts analysis

One ongoing problem with project be specific FP amendments is that sideline legal limitations are removed without replacement limitations. This leaves the field wide-open, even erasing the field itself.

Also, removal of Standards has direct environmental effects on resources that have been protected, however unintentionally, by those Standards. These effects are real and are directly related to the action of waiving the Standards. You are required to analyze and disclose such effects in proper NEPA documents.

- Please make it clear where you have answered our questions and provided missing information as this process moves forward.
- Please explain and describe the NEPA process moving forward after the Mud Creek DEA comment period.
- For the many reasons listed above the Mud Creek DEA is in violation of NEPA, ESA, APA, NFMA and the Migratory Bird Act.

It should be stated that, with this project, the Forest Service continues to perform “business as usual,” only more quickly and forcefully. This is in spite of the fact that continuing to perform actions which are now understood to be detrimental to the forest and the ecology of the lands they oversee is not a prescription for positive, long-term results. The rapidly warming Earth is already causing injurious effects to all fauna and flora which inhabit the planet. All species, including humans, are already feeling the effects of ill-advised human activities. All of us, especially governmental agencies like the Forest Service, must change, now. Global warming has reached crisis stage and must be dealt with at every level to forestall a catastrophe of global proportions which will affect every one of us.

Sincerely,

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