Mud Creek Objections

Objection Reviewing Officer:
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Responsible Official:

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Submitted Electronically on August 20, 2021, to: appeals-northern-regionaloffice@usda.gov

Introduction

Previous comments were submitted on this project's (Mud Creek) scoping (October 2019) and Draft EA (April 2021). Scoping comments, Draft EA, and Objections to the Final EA submitted by Friends of the Bitterroot (FOB), Alliance for the Wild Rockies (AWR), Wild Earth Guardians (WEG), Michele Dieterich, Jeff Lonn, Van Keele, and Larry Campbell are incorporated herein and must be considered a portion of this objection document.

Conclusions based upon the most recent scientific research, disagree with claims in the Mud Creek FEA of June 2021. Furthermore, the EA, along with much of the other Mud Creek documentation, misleads the public about the intent of this project.

A careful reading of the Mud Creek documentation reveals that the listed purposes—improve landscape resilience, reduce crown fire potential, improve habitat and forage quality, and design and implement a suitable transportation and trail system—are assigned minimal value; the principal objective of this project is the short-term production of the largest possible amount of marketable timber.

The Agency, with encouragement and support from the timber industry, is misusing science, transforming misinterpreted research into propaganda and disinformation, and attempting to portray logging/thinning as benign activities assisting the environment. Destroying wild fish runs, converting forests into tree farms, and pillaging the resources of future generations are advertised as giving mother nature a helping hand, allegedly a virtuous and honorable calling.

Comments that follow address the Mud Creek Final EA project proposal and its use of a condition-based implementation. Remedies and requests are underlined.

Copies of reference material are available upon request.

The Final EA

Location (FEA, page 1)

The project area is in the Bitterroot Mountains southwest of Darby, Montana, on the West Fork Ranger District of the Bitterroot National Forest (Figure 1, page 1 – please note, after page ii, the next three pages of the FEA are numbered as #1). The project area encompasses approximately 48,486 acres and includes the entire West Fork Bitterroot River-Rombo Creek watershed and portions of the Nez Perce Fork-Nelson Lake, Little West Fork, West Fork Bitterroot River-Lloyd Creek, Lower Blue Joint, and West Fork Bitterroot River-Painted Rocks Lake watersheds in the Bitterroot Mountain Range. The area is accessed by the public mainly from the West Fork Highway and the Nez Perce Road.

The project area is primarily allocated to timber management, big game winter range forage production, partial retention visual quality objectives, and semi-primitive recreation (management areas 1, 2, 3a, and 5) in the Bitterroot Forest Plan (Appendix C-1, map 2). The Mud Creek project area is made up of a variety of vegetation cover types (as identified through the USFS Northern Region Existing Vegetation Mapping Program) and mostly consists of Dry Douglas-fir, ponderosa pine, lodgepole pine, and spruce/fir. The West Fork Bitterroot River and Nez Perce Fork comprise the primary hydrologic features within the project area.

Need (FEA, pages 3, 4)

The Mud Creek project will focus on 1) the departure from historic disturbance regimes and subsequent existing vegetation and fuel conditions; 2) decrease in quality and abundance of important wildlife habitats due to vegetative changes; and 3) conditions related to the current road and trails network.

Vegetative conditions due to departure from historic disturbance regimes:

Vegetative conditions in the project area have decreased the resilience of forest vegetation to future disturbances and stressors such as insects, disease, fire, and a warming climate. Fire suppression efforts since the early 20th century have caused a departure from historic fire regimes in the project area, resulting in forest stands characterized by high stem densities, hazardous fuels build up, and stressed tree condition. This change in forest structure has caused these areas to have high surface and ladder fuels, which increase susceptibility to uncharacteristic fire behavior.

Fire risk to communities in the project area is high; the wildland-urban interface constitutes approximately 43% of the assessment area and an additional 29% of the assessment area is in the ignition density-community protection zone. The wildland-urban interface in general constitutes areas where human development meets or intermixes with wildland fuel. Particular wildland-urban interface boundaries are tools to guide fire management and help understand levels of wildfire risk to communities. The Bitterroot Community Wildlife [sic] Protection Plan did not designate an official wildland-urban interface boundary in Ravalli County; the definition and delineation of the wildland-urban interface boundary within the

Mud Creek project boundary will use the criteria specified in the Healthy Forest Restoration Act of 2003 (16 USC 6511(16)(B)). The ignition density-community protection zone is an additional tool to understand fire risk to communities and fuel management. The ignition density-community protection zone on the Bitterroot National Forest was delineated based on modeling completed in 2016 showing the probability of ignitions reaching state or private lands. The fire and fuels specialist report, PF-FIRE-001, provides additional detail about the wildland-urban interface and community protection zones, including maps of their boundaries and the locations of structures.

Lack of fire has also reduced meadow habitat size and quality by failing to prevent conifer encroachment and stimulate forbs and grasses. In addition, the absence of fire has caused a shift toward dense stands, mature size classes, and tree species, such as Douglas-fir, subalpine fir, and grand fir, that are more susceptible to insect disturbance than forests subject to historical fire regimes in the area. For more detailed background information about disturbance regimes, disturbance risk, and current and historical vegetation characteristics, see the silviculture and fire and fuels specialist reports, PF-SILV-001 and PF-FIRE-001.

Based on these conditions, there is a need to:

- Reduce crown fire hazard potential within the wildland-urban interface (WUI), adjacent community protection zone, and low severity fire regimes; and
- Reduce stand densities, increase age class diversity, and favor shade intolerant species to promote resilience to stressors (e.g., drought, insects, and diseases).

Decrease in quality and abundance of important wildlife habitats due to vegetative changes

The departure from historic fire regimes and vegetative conditions also has implications for wildlife. Extended fire return intervals contribute to conifer encroachment in meadow habitats across the landscape. These habitats are important areas for wildlife species such as elk, mule deer, moose, bighorn sheep, and numerous songbirds. In addition, the shift in species composition and subsequent high densities of shade-tolerant understory species can limit the availability and distribution of forage for large ungulates. Natural fire regimes in the warm and dry environments that maintain or reduce tree densities allow for more sunlight to hit the forest floor and thus increase forage production and availability for big game in winter range and bighorn sheep lambing and summer range.

Based on these conditions, there is a need to:

- Improve habitat and forage quality and quantity for bighorn sheep, mule deer, elk, and other regionally sensitive species.

Conditions on the existing road system pose resource concerns and do not comply with the Bitterroot Travel Management Plan:

The project area currently has one of the highest road densities found on the Bitterroot National Forest, with a total of nearly 300 miles of unrestricted, restricted, and undetermined roads. Field surveys have identified some road segments in need of

maintenance and repair to address resource concerns (e.g., watershed health). Some third order drainages currently exceed Bitterroot Forest Plan road density standards for elk habitat effectiveness. Opportunities exist to designate new motorized and non-motorized trails and make on-the-ground conditions compatible with road travel status in the Bitterroot Travel Management Plan. The Mud Creek Project interdisciplinary team conducted a travel analysis and addressed issues pertaining exclusively to route designations subject to 36 CFR 212, subpart B; the responsible official will not identify a minimum road system in the project area per 36 CFR 212.5(b)(1).

Based on these conditions, 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.

Purpose (FEA, page 4)

The purpose of the Mud Creek 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.

Issues (FEA, pages 6, 7, 8)

The following issues were identified based on review of the public comments received during public meetings and other scoping activities, internal review, and preparation of this EA:

AQUATICS

- How would the proposed action affect sediment delivery to streams and other aquatic habitats?
- How would sediment delivery associated with the proposed action affect aquatic species?

FOREST VEGETATION

- How would the proposed action affect forest vegetation, specifically: species composition; stand density; and structural stage diversity?
- How would altering forest vegetation through treatment affect resilience of vegetation to disturbance, including fire, insects, and disease?
- How would the proposed action affect old growth character/abundance and resilience of old growth stands?
- How would the proposed action affect forest carbon storage and resilience in the face of climate change?

FUELS and FIRE

- How would the proposed action alter fuels and affect potential fire behavior in the WUI and warm dry forest types?
- How would the proposed action lessen impacts from wildfire on the adjacent community, firefighter/public safety, and natural resources or values?

RARE PLANTS

- How would the proposed action affect the abundance and viability of rare plant species in the project area?

RECREATION

- How would the proposed action affect: access to recreation sites; quality of experience; and the diversity and type of recreational opportunities?

SCENERY

- How would the proposed action affect scenic integrity?

SOILS

- How would the proposed action affect soil quality?

WILDLIFE

- How would the project affect threatened and endangered wildlife species?
- How would the project affect Regional Forester Sensitive Species?
- How would the proposed action affect elk and their habitat, including: quality and abundance of winter range; habitat effectiveness; and vulnerability/security?
- How would the project (including the old growth amendment) affect wildlife species associated with or dependent on old growth (management indicator species)?

Additional Resource Concerns (FEA, page 8)

The following issues related to forest vegetation were expressed during scoping. These were addressed through in-depth analysis (see PF-SILV-001 and PF-SCOPE-037 for full scoping comment considerations).

- Interest in clearcuts to reset succession and allow for greater plant diversity.
- Concern about clearcuts and the potential for stands to regenerate given climate change.
- Interest in management to reduce dwarf mistletoe.

- Interest in letting insects and disease naturally thin the forest.
- Concern for the ponderosa pine old growth stands located at the bottom of Soda Springs Creek and the extreme fire risk due to encroaching Douglas-fir ladder fuels.
- Interest in a thorough field inventory of old growth, and concern about commercial logging or roads built within these stands, but interest in understory non-commercial thinning and/or prescribed burning.
- Interest in treatment and actions that align with Churchill and Larson's Individuals Clumps and Openings (ICO) approach to ecological restoration.
- Concern about landscape resilience and interest in applying the same management strategy that is the WUI throughout the project area.
- Concern about treating areas that historically had infrequent mixed and high severity fires, such as steep north-facing slopes and riparian areas.
- Interest in site-specific treatments designed through careful site analysis before recommending treatment.

My Comment: 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. (DEA Comments, page 2)

Forest Service Response: The environmental assessment describes the need for the proposal (FSH 1909.15, chapter 40, section 41.21). The Forest Service has the discretion to determine that need, including its scope. For the Mud Creek project, the responsible official used the information about current conditions, as described in chapter 1 of the environmental assessment, to determine the purpose and need, including the broad types of resource management encompassed by the project. In the case of the Mud Creek project, the purpose and need includes management of vegetation and the road and trail systems. (Draft DN Appendix B, page 4)

Commentary: The fact that the FEA provides only two alternatives, "do nothing" or "do what is proposed," is problematic and probably illegal. In 1997 the 7th Circuit Court held that "a federal agency' failed to examine the full range of reasonable alternatives…" (Simmons v. US Army Corps of Engineers – 1997, No. 97-1131). Other than the two offered, there are other obvious alternatives. The project should include those to keep from running afoul of NEPA directives.

Suggested Remedy: The Agency must pull the FEA and provide additional alternatives for this project. Any project must be based on the most recent, best available science.

My Comment: As stated on page 4 of the Draft EA, "The project area currently has one of the highest road densities found on the Bitterroot National Forest. Field surveys have identified some road segments in need of maintenance and repair to address resource concerns (e.g., watershed health). Some third order drainages currently exceed Bitterroot Forest Plan road-density standards for elk habitat effectiveness."

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. (DEA Comments, page 8)

Forest Service (Indirect) Response: Chapter 1 of the environmental assessment describes the rationale for the responsible official's inclusion of the transportation system management component of the project. The project area has high road densities and some road segments need maintenance because they are causing resource concerns. The affected environment section of the aquatics specialist report (PF-AQUATICS-007) describes in detail current water and fisheries resource concerns related to the conditions of the road system including sedimentation and effects to hydrologic processes. The wildlife specialist report describes how the existing road network density in the project area affects elk security.

For the final environmental assessment, the interdisciplinary team prepared a map of current road densities by watershed, which is available in appendix C. In addition, project file document AQUATICS-007 contains additional information about road densities by watershed, and project file document WILD-025 contains a map of 3rd order drainage compliance with the forest plan elk habitat effectiveness standard. Post-project road densities are not depicted or described quantitatively, because specified and temporary road construction is conditional on vegetation management. Chapter 3 of the environmental assessment and the specialist reports in the project file describe the environmental effects of the project's transportation system management. (Draft DN Appendix B, pages 5, 6)

Commentary: 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. (Pages 108, 115, and 116). (Haynes, 1996) (Quigley, 1996)

There is no analysis in the Mud Creek FEA of motorized road and trail use impact on grizzly bears.

Roads adversely affect hydrology and geomorphic features (debris slides and sedimentation), habitat fragmentation, predation, roadkill, invasion by exotic species, dispersal of pathogens, degraded water quality, chemical contamination, degraded aquatic habitat, use conflicts, destructive human actions (trash dumping, illegal hunting, fires), lost solitude, depressed local economies, loss of soil productivity, and decline in biodiversity. (Gucinski, 2001) Roads influence 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, 2000) (Gucinski, 2001) (Rowland, 2000) (Bader, 2021)

The Mud Creek FEA does not consider that roads increase the efficiency of water transport during storm or snowmelt with damaging effects. The FEA ignores water yield as a factor without explanation. FS hydrologist Johnson (1995) discussed many forms of road-related and other cumulative impacts the FEA 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, 2000) (Jones, 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. (Frissell, 2014)

The Agency declares that "Post-project road densities are not depicted or described quantitatively, because specified and temporary road construction is conditional on vegetation management." (Draft DN Appendix B, page 6). Other than revealing how condition-based projects restrict information, data the public desires, that statement sidesteps the well-known issues caused by high road density.

Suggested Remedies: The Agency must define what the open and total motorized route density will be in the four sub-project areas for each of the next 20 years.

The FS must reveal how road densities, during the 20-year project implementation, 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.

Please explain where security areas will be provided during this time frame; the expected illegal motorized use must also be considered.

Please explain how Montana's increased trapping season, snaring, and large leg traps will affect grizzlies in the project area.

The FS must perform a more in-depth analysis of the problems being caused by the high road density in the project area and reveal the results. The current levels of analysis are insufficient.

My Comment: 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. (DEA Comments, pages 1, 2)

Forest Service Response: The Forest Service has the discretion to determine the purpose and need. The Forest Service used internal review and comments received during the scoping comment period to refine and clarify the purpose and need. Apart from reorganization of the purpose and need statements for the sake of clarity, the only substantive change to the purpose and need was the removal of the purpose to conduct a programmatic forest plan amendment related to elk habitat objectives. The responsible official decided not to pursue a programmatic forest plan amendment in association with this project. (Draft DN Appendix B, page 7)

Commentary: The Agency declares "The responsible official has the discretion to determine the scope and scale of the project, and the responsible official has determined that the project, including the implementation process, is consistent with all laws, regulations, and policies, including the 2012 Planning Rule (36 CRF 219 et seq.)." The FS response ignored the paragraph[1] preceding my comment and simply declared the "responsible official" can determine the purpose and need.

That response does not explain any connection between "roads and trails" and "resilience to disturbance and reducing crown fire hazard potential."

Suggested Remedy: Please explain the logical connection between "roads and trails" and "resilience to disturbance and reducing crown-fire potential."

My Comment: The decision to perform a single NEPA evaluation (EA) for such an extensive project (expected to span a 20-year period) is legally dubious and unquestionably invalid, especially during a period when the climate is rapidly changing. (DEA Comments, page 7)

[1] "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." (DEA Comments, page 1)

Forest Service Response: The Mud Creek implementation process is designed to be immediately responsive to conditions on the ground. The implementation process allows for design of treatment units in response to preliminary field data and use of those proposed treatment units in a timelier manner than designing treatment units prior to issuing a project decision. This approach is especially pertinent in the context of a changing climate, in which disturbance frequencies and intensities are increasing. Fieldwork conducted during the implementation process will provide much greater site-specificity than models used to design the proposed action, and update of the models used to design the proposed action will not be necessary to carry out implementation.

The responsible official has the discretion to determine the scope and scale of the project, and the responsible official has determined that the project, including the implementation process, is consistent with all laws, regulations, and policies, including the 2012 Planning Rule (36 CRF 219 et seq.). If changes in leadership or interdisciplinary team membership were to occur during the implementation period, the implementation process provides the steps to which the Forest Service must continue to adhere in order to be consistent with the Mud Creek decision notice. (Draft DN Appendix B, page 9)

My Comment: 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 Draft EA 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. (DEA Comments, page 6)

Forest Service Response: As described by the decision notice, the responsible official has found that the environmental assessment is consistent with all requirements of the National Environmental Policy Act and its implementing regulations at 40 CFR 1500 et seq. and 36 CFR 220 et seq. The environmental assessment shows that the effects of the proposed action do not constitute significant effects on the quality of the human environment. The effects analyses in the environmental assessment are based on the maximum potential effects of the proposed action, using the assumption that conditions during the implementation period would warrant the upper limit of treatment. Because the upper limits of treatment do not rise to the level of significance, as determined in the finding of no significant impact, implementation of less than the upper limits of treatment would also not rise to the level of significance. The use of strict and detailed design features that have commonly ensured resource protection in past projects that used treatments like those proposed for the Mud Creek project allows analysis of effects without site specificity.

The public participation process has included a pre-scoping open house and field trip, a 30-day scoping comment period, and a 30-day comment period on the draft environmental assessment, in fulfillment of the requirements for public participation under the National Environmental Policy Act. In addition, the interdisciplinary team worked with local collaborative groups and interest groups to develop the proposed action, as described by the

draft decision notice. Public workshops and review periods will provide opportunity for public participation during the implementation process. (Draft DN Appendix B, page 66)

Commentary: Condition-based implementation of this project violates NEPA and NFMA. Under the condition-based approach, specific locations and types of treatments would be based on local conditions identified or refined during execution. Associated checklists in the DEA Appendix B describe the implementation process.

It is only *after* the Responsible Official signs the decision and *after* the Objection Reviewing Officer takes final administrative action that the FS will disclose the specific activities proposed for specific locations. By then the NEPA process is finished and it will be too late to properly analyze the direct, indirect, and cumulative impacts of the proposed activities.

The Mud Creek FEA describes nine steps for implementation (DEA Appendix B, pages 2,3):

> This section describes the implementation process steps in detail. The nine process steps move an activity through identification and prioritization, field review, contracting and documentation, and monitoring and adaptive management. In brief, the 9 steps are:
>
> 1. Determine activity to be implemented
> 2. Check against the environmental assessment, decision, and design features
> 3. Obtain line officer approval and place in out-year plan
> 4. Conduct fieldwork and consultation (if needed)
> 5. Line officer approval to implement
> 6. Prepare contract documents and other implementation documents
> 7. Implement the activity and document implementation
> 8. Monitor
> 9. Adaptive management

Steps 1, 4, and 5 are normally and correctly conducted *during* the NEPA process under non-conditioned-based project development scenarios. The FS fails to justify postponing those steps post decision—completely bypassing site-specific disclosure and analysis. The Agency arbitrarily changed its analysis process, without considering the significance for public involvement, trust, accountability, and to the environment.

Part of the FEA said to be the "Implementation Process" reveals more about how squishy the approach is in relation to NEPA:

> "This is meant to be a 'living' document and may need to be adjusted as we learn more through the implementation of each activity. As activities are designed, the process may be refined, and new technology or expertise may be used." (DEA, Appendix B, page 1)

An indication of FS thinking is:

> The condition-based approach takes into consideration the landscape as a whole both spatially and temporally to address management needs more holistically and in a timelier manner than a series of individual projects. (FEA, page 10)

The FS is arguing it can save time. There is no mention of better decision-making, public involvement, or overall management. Will a condition-based approach actually be "timelier"?

Examine the faux public process steps. The EA states, "Each year, public involvement will occur to discuss proposed activities and provide updates for ongoing or completed activities" (DEA Appendix B, page 2). "Public involvement" seems to be:

> "During off-season implementation workshops, the Forest Service, public, and Tribes may present proposals for an activity covered in the environmental assessment. It is the expectation that at these workshops an array of activities that meet the project purpose and need and were authorized under the signed decision will be presented. The public, Tribes and the forest may refine locations, treatment, design components, methods, mitigation measures, and integration opportunities through a collaborative process.
>
> "After workshops with the public and Tribes, draft maps and the unit table of the proposed activities will be posted to the project website for an additional 30-day opportunity for public and partner review and feedback. A public notice will be published in the *Ravalli Republic* and a press release will be sent out to notify the public that the outyear plan is available for review and feedback. This post-workshop feedback period gives an opportunity for the public that may not have been able to attend the workshops to provide input before the proposed activities become final." (DEA, Appendix B, page 2)

So, every year the Mud Creek CBIA Plan is being implemented, the FS claims it will be doing these workshops, meetings, project design specifications, making maps, and conducting a 30-day "public and partner review and feedback" processes. The FS will do this least once, potentially more frequently.

It is difficult to believe this process is "timelier" than conducting one-time, true, NEPA project planning.

It may be "timelier" if the FS conducts those procedures in a perfunctory manner, ignoring concerns of those who disagree with their arbitrary purpose and need and/or desired conditions. Unlike under the NEPA process, there is no regulation defining the condition-based project's "public and partner review and feedback" or "collaborative" processes. Thus, there will be no accountability.

At least once every year, the FS "The line officer with the delegated authority (as outlined in Forest Service Handbook and Forest Service Manual) retains the authority to make final decisions related to location, extent, and types of activities planned and completed, consistent with the decision. The line officer responsible for implementation of the Mud Creek project will be the district ranger for the West Fork Ranger District." (DEA, Appendix B, page 5). However, there will be no review of the District Ranger's "final decisions" because there is no regulation defining a review.

And "if any future activities are proposed for implementation that were not covered in the original Letter of Concurrence or Biological Opinion, then Section 7 consultation will have to be re-initiated and completed before those activities can occur." (DEA, Appendix B, page 10). For ESA issues, there could be multiple reviews by the U.S. Fish and Wildlife Service—the FS must admit that such reviews are rarely "timely." It also seems that these collaborators could choose (and the Line Office authorize) actions outside the bounds of what the FEA specifies. Unless there is a link to the ESA, the Agency is saying no one would have recourse to the law.

The FS will be unable to execute this procedure properly because of chronic underfunding. The FEA contains no analysis of the economic feasibility for even one of the new, novel procedures which it should under NEPA.

It appears a part of this condition-based project is the formal institution of the Wildland Urban Interface (WUI) and Community Protection Zone (CPZ), two geographic entities whose implications were not contemplated or analyzed for under the BNF Forest Plan. It also attempts to legitimize the Montana Forest Action Plan for providing direction on national forest land, something intended to be accomplished with proper NEPA.

While the FS attempts to evade genuine project NEPA analysis, it also fails to conduct programmatic planning consistent with the Planning Rule, in violation of NFMA as well as NEPA. This condition-based project will be conducted "over a 20-year time period" equal to the expected lifespan of a forest plan.

A court case (Southeast Alaska Conservation Council, et al. v. United States Forest Service, et al., Case No. 1:19-cv-00006-SLG) determined condition-based projects fall outside of NEPA regulations.

Suggested Remedy: The Agency must withdraw this condition-based project proposal and conduct a proper EIS.

My Comment: The project should budget (and include) the funds required for post-project monitoring. Without monitoring, it is impossible to know whether management activities really accomplish project goals. Information gathered during monitoring can and should be used to help in the design of future projects. (DEA Comments, page 9)

Forest Service Response: The implementation process in appendix B of the environmental assessment outlines the project-level monitoring protocol for the Mud Creek project. The Mud Creek monitoring protocol is a required component of the implementation process. The monitoring protocol includes resource-specific monitoring items for fisheries, heritage resources, air quality, fire and fuels, invasive plants, soil, water, transportation, silviculture, rare plants, native plant revegetation, and wildlife. These monitoring items are designed to ensure project activities and design features are achieving intended results and help inform the design of subsequent treatments in the project area. The interdisciplinary team will summarize monitoring results and store them in the project record. The Forest Service, partners, and the public will be able to use the monitoring results during the annual implementation workshops in the design of implementation units for future implementation phases. The use of monitoring data will provide information needed for adaptive management during the implementation period.

These project-level monitoring items complement the existing forest-level monitoring items contained in the 2016 forest-wide monitoring program. While the Bitterroot National Forest has not yet finalized a biennial monitoring evaluation report under the forest-wide monitoring program, monitoring data collected pursuant to the forest-wide program and other project-level monitoring informed the Mud Creek planning process and environmental effects analysis

where data were available and pertinent. A draft of the 2019 biennial monitoring evaluation report is available in the project file, along with past monitoring reports from 2002-2008 and 2010-2013, in SOILS-006. Chapter 2 of the environmental assessment refer to monitoring results for the effects of mechanical harvest and prescribed fire on old growth stands in the Como Forest Health Protection Project. Additional documents in the project file contain monitoring data or describe monitoring results that demonstrate the effectiveness of design features, best management practices, and site-specific mitigations to protect soils (PF-SOILS-006) and aquatic resources (PFAQUATICS-004, -007, -009). Results of wildlife surveys in the project area are contained in the wildlife specialist report and appendices (PF-WILD-001, -025).

The Forest Service commits to the requirements of the project decision, which includes the monitoring protocol described in appendix B of the environmental assessment. The Mud Creek interdisciplinary team will carry out required monitoring and enhance capacity through partnerships and use of external data where possible. (Draft DN Appendix B, page 10)

Commentary: Although the Agency response discusses monitoring on a forest-wide basis, project-specific monitoring (and the funding of same) was ignored. Conducting and recording monitoring results on a forest-wide scale dilutes data; it is therefore statistically meaningless for the site-specific, management-activity impacts.

Suggested Remedy: The FS must include fully funded, project-specific monitoring for this project proposal and make the findings available to the public

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My Comment: 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 water-management activities do more to reduce the effects of wildfire than the current assortment of Forest Service standard practices. (Goldfarb, 2020) (DEA Comments, page 6)

Forest Service Response: The Forest Service recognizes that beavers benefit the resilience of ecosystems within the plan area. However, because the purpose and need are focused on resilience of and fire risk in upland forested ecosystems, management of beaver populations is outside of the scope of this project. The final environmental assessment includes an alternative not analyzed in detail regarding management of beaver. (Draft DN Appendix B, page 15)

Commentary: The BNF Forest Plan includes Forest-wide Management Standard, "Beaver will be introduced into suitable riparian habitat." (FP, chapter II, page 20). The Mud Creek Project violates this requirement.

The Mud Creek Project Decision Notice (DN) states, "We designed the Mud Creek Project to address decreased resilience in forest ecosystems, decreased quality and abundance of important wildlife habitats, and resource concerns related to the existing roads and trails systems." (DN, page 2)

The Purpose and Need statement (DN, page 2) includes:

- "Improve landscape resilience to disturbances (such as insects, diseases, and fire) by modifying forest structure and composition and fuels; 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."

Wildfire and forest roads are the most common disturbances on the BNF landscape which increase runoff. Beaver improve landscape resilience by helping to decrease stream siltation, provide flood control, and reduce stream channel instability.

Despite public comments and the inclusion of beaver reintroduction in the Forest Plan, the project file wildlife reports sidestep the requirement.

Suggestions regarding beaver introduction into the project area were immediately dismissed. The FS acts as if the only two tools available to achieve its arbitrary Purpose and Need are chainsaws and fire (prescribed). Ignored are tools that nature provides such as the beaver.

Appendix A – Forest Plan Consistency, includes a chart which discloses the Standard: "Wildlife and Fish No. 10 - Beaver will be introduced into suitable riparian habitat." (Draft DN Appendix A, page 4)

The column labeled "Applicable to planning/project development" indicates "Yes," the Standard is applicable.

The column labeled "Specific Design Feature, if needed" the chart indicates "Yes," and asks, "Have we ever done this?"

The column labeled "Activities/Areas where applicable" discloses that Forest Plan consistency requires the Standard to be applied, "Project area wide as required based on management area-specific criteria."

Because the Agency ignored the Forest Plan standard, the Mud Creek DN and FONSI violate the BNF Plan and violate NFMA. NEPA is violated by lack of analysis and full disclosure.

Suggested Remedy: Pull the Decision Notice and FONSI and then redesign the project to include the mapping of suitable riparian habitat and the introduction of beaver into the project area.

For the environment to benefit from the reintroduction of beaver, the FS must consult with Montana Fish, Wildlife, and Parks and then fulfill the legal requirement for federal agencies to enforce the protection of wildlife and prohibit hunting and trapping of beaver and other aquatic mammals that inhabit waterways on federal public land. (Nie, 2017)

My Comment: This project includes project-specific amendments (elk habitat effectiveness [EHE], thermal, and hiding cover plus old-growth and course-woody debris) to the current Forest Plan. Project-specific amendments are intended address unique characteristics of a particular area, not conditions common to an entire forest. In a similar situation, a court held that a FS failure to explain what conditions within a project area supported a site-specific amendment over a forest-wide amendment. The court explained that a site-specific amendment "must be based on unusual or unique aspects of the site itself when compared to the forest generally." Because, over the last 12-year period, the BNF used EHE site-specific

amendments on more than 226,000 acres of the almost 390,00 suitable timberland acres, the Agency is likely running afoul of legal precedent and should place this project on hold until such time as appropriate amendments to the current Forest Plan are completed. (DEA Comments, page 8)

Forest Service Response: According to the 2012 Planning Rule, "Plan amendments may be broad or narrow, depending on the need for change, and should be used to keep plans current and help units adapt to new information or changing conditions. The responsible official has the discretion to determine whether and how to amend the plan and to determine the scope and scale of any amendment" (36 CFR 219.13(a)). The responsible official has determined that the conditions in the project area warrant project-specific forest plan amendments. The amendment to the forest-wide standard for elk habitat effectiveness is based on the small size of 3rd order watersheds in the project area, which limits the distance of roads that may be present under the existing forest plan standard, which in turn limits forest management access and conflicts with other multiple use management objectives. The amendment to the forest plan record of decision direction regarding thermal cover in elk winter range is based on the variety of disturbance that has occurred in the elk analysis area since the finalization of the forest plan, including vegetation management, prescribed fire, and numerous wildfires, each of which has altered the spatial arrangement of cover types. Despite the fluctuations in thermal cover, the elk population in the elk analysis area has continued to trend upward, providing support for research that has become available since the finalization of the forest plan that suggests that thermal cover in winter may not be as important for elk as once thought (Cook et al. 1998). The amendments to the forest-wide and management area standards for old growth and coarse woody debris are based on the variety of forest types in the project area. The current forest plan description of old growth was derived from forest types different than those in the project area, and more appropriate scientific information to guide management direction for old growth in the project area is available. Similarly, the current management area direction for coarse woody debris retention does not recognize the differences in historic range of variation of coarse woody debris among forest types, as shown in current best available scientific information. (Draft DN Appendix B. page 16)

Commentary: According to the Draft Decision Notice, this proposed project includes three site-specific Forest Plan amendments (DN and FONSI, page 24):

- Elk habitat standards related to road densities and thermal cover
- Old growth standards
- Coarse woody debris standards

The FS has not explained which characteristics of the project area are different from other portions of the BNF. It is possible the reason for these amendments is not because the project area is different but that the Agency wishes to circumvent the existing Forest Plan requirements.

In League of Wilderness Defenders v. Connaughton (Case No. 3:12-cv-02271-HZ), the U.S District Court (Oregon) declared:

"…, a close reading of Lands Council v. Martin indicates there must be at least some characteristics unique to a site to support a site-specific amendment. Lands Council v. Martin, 529 F.3d at 1228. Here, Defendants and Intervenors fail to point to any characteristics unique to the Project area to support the site-specific amendment. Similarly, at oral argument, when asked specifically to explain what conditions existed within the Project area that supported the selection of a site-specific amendment, the parties were unable to provide any explanation other than the fact that the amendment was tailored and applicable only for the Project area.

Simply explaining the purpose of the Project, the desired conditions for the Forest, or stating that the amendment is site-specific because it was designed for a specific site, does not satisfy the rational connection between the facts found and the choice made required by Lands Council. Because the Forest Service failed to explain why it chose a site-specific amendment, the Court finds that the decision to enact a site-specific amendment was arbitrary and capricious and grants summary judgment to Plaintiffs on this claim."

Recommended Remedy: Unless the FS can conclusively show what differentiates this project area from the rest of the BNF, this project, including the Forest Plan amendments should be withdrawn.

Implementation of this (or any other) proposed project should not be allowed until the Forest Plan is properly updated by following NEPA regulations.

My Comment: In the case of reworking the EHE, because species besides elk are affected, reworking the EHE analysis beyond the effect on elk is required. (DEA Comments, page 7)

Forest Service Response: The wildlife section of the draft EA summarized the Wildlife Effects Analysis Report (PF-WILD-001, pp. 30-38; PF-WILD-024, pp. 16-21; PF-WILD-025, pp. 13-23) which evaluated the environmental consequences of the proposed action on elk, and discusses the need for project specific amendments, included in the draft EA (Appendix D).

The Wildlife Effects Analysis Report (PF-WILD-001, p. 38) notes that "all existing motorized roads and trails open at any time during the year" were used to determine the project will result in a net increase of 221 acres of elk security habitat. The draft EA (pp. 37-42) notes that all new road construction (specified or temporary) will be closed to public access (specified) or obliterated (temporary) within specific timeframes. Illegal road use is not part of the proposed action and is thus not analyzed. Montana Fish, Wildlife, and Parks is responsible for managing hunting seasons, structures, and license setting and does not collect data on elk harvest locations. See the response to Wildlife, concern group 10 for more information. (Draft DN Appendix B, page 17)

Commentary: The roads analysis and effects on streams in the DEA do not account for the illegal, continual public motorized use of closed and administrative roads or the illegal off-roading that is rampant on the BNF. That ignores the significant amount of sediment those activities contribute to streams. Without complete enforcement of the rules and regulations, these activities will continue.

It is 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, 2001)

The Agency declared "Illegal road use is not part of the proposed action and is thus not analyzed." (Draft DN Appendix B, page 17). That response is unacceptable.

Suggested Remedy: Before implementation of this proposed project, the Agency must thoroughly analyze (and reveal) illegal road use, including exactly how such use contributes to the degradation of habitat for all wildlife, not just elk, and indicate how they will effectively enforce the rules and regulations related to closed roads, administrative roads, and illegal off-roading.

My Comment: 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 wide-ranging disagreement over what historical conditions were. (DEA Comments, page 9)

My Comment: 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. (Rapp, 2003). (DEA Comments, page 9)

Forest Service Response: The Forest Service acknowledges that management, including harvest, to increase resilience in mature forests, including old growth, is controversial, while also acknowledging substantial scientific information suggesting that timber harvest can indeed be a useful tool to restore and maintain resilient forests. The proposed action is designed to maintain and improve stand resilience to insects, disease, and fire in all old growth stands. The Forest Vegetation/Silviculture Report contains detailed information on the old growth existing condition (starting on page 12) and describes how old growth stands are measured, the minimum stand characteristics required to qualify as old growth, a map of the existing old growth by third order drainage (Map 2, page 14), historic conditions, climatic changes, desired conditions (page 15), and the effects of the No Action alternative (page 36) versus the effects of the Proposed Action and the Forest Plan amendment (page 48). The Regulatory Framework section (page 51) discusses how the project is consistent with the Forest Plan. The Implementation Process (Appendix B of the environmental assessment) describes the required steps taken during the implementation phase to identify old growth including R1 Walk-though exams, stand diagnosis, and silvicultural prescriptions.

The site-specific forest plan amendment (Draft EA, page 35 and Appendix D, page 7) on old growth adopts an approach to identifying old growth stands that is more inclusive than the current forest plan old growth definition, allowing more stands to be identified as old growth and managed for old growth into the future. The current forest plan definition of old growth is a one size fits all description that does not include tree age or specificity for different forest types. Just as forest types change from warm aspects to cool aspects and low elevation to high elevation, old growth stand characteristics change. The Bitterroot Forest Plan completed in 1987 cites (Franklin et al. 1981). Ecological characteristics of old-growth Douglas-fir Forests. General technical report PNW-118. Portland, OR: Pacific Northwest Station, Forest Service, USDA. This general technical report is a study of Douglas-fir old growth forests in the northern Pacific northwest. The forest types in the northern Cascade mountains vary greatly and do not represent the forest types and old growth types found in the much drier forests of the Bitterroot National Forest. This literature is no longer the best available science.

The plan amendment uses (Green et al. 1992) to identify old growth stands in the project area, basing old growth criteria on site specific habitat types. Green et al. (1992) described old growth characteristics specific to forest types that are found in the Northern Region, so it is more relevant to the Bitterroot National Forest and the project area. The current Forest Plan definition does not allow any high elevation stands to be considered as old growth because these high elevation trees rarely reach 20 inches in diameter at breast height (DBH) even in old age. Additionally, many of the low elevation, warm and dry ponderosa pine stands containing scattered legacy ponderosa do not have enough large old trees per acre to meet the current forest plan definition. The early stages of collecting stand data in the project area have shown that 7 out of 10 potential old growth stands do not qualify as old growth under the Forest Plan's criteria; however, they do qualify under the criteria provided by Green et al. (1992). As stated in the Draft EA, Issue 3 (page 72) and SILV-001 (page 48), "This amendment provides a better foundation to meet the purpose and need of the project, meet the Forest Plan goals and objectives, meet the 2012 Planning Rule requirements, and maintain and manage old growth in the Mud Creek project area."

The Mud Creek project includes commercial treatments in old growth stands; however, specific locations and treatment needs, commercial and non-commercial, will be determined during the implementation phase based on site-specific data collected during the walk-through and stand diagnosis process. The public will have the opportunity to review site-specific information to collaborate in the development of treatment units during annual implementation workshops, as described in appendix B of the environmental assessment. The silvicultural prescription will document the prescribed treatment to move the stand from the existing conditions to the desired future conditions. Not all stands will be treated within the project area boundary. Only stands for which site-specific data indicates a departure from desired, resilient conditions will be proposed for treatment. In addition, no old growth stand will be removed from old growth status (as defined under the site-specific plan amendment) during commercial harvest. In stands proposed for treatment but where commercial harvest is not deemed to be necessary to meet desired conditions, noncommercial understory treatments and/or prescribed fire will be the primary treatments. Alternatives considered but not analyzed in detail (Draft EA, page 44) include limiting old growth to non-commercial methods only. The Draft EA explains this

alternative in detail and provides an example from an old growth stand in Mud Creek. It is important to note that while Green et al. (1992) and the Forest Plan provide minimum criteria for identifying old growth, that does not mean all stands will be treated and harvested to the minimum criteria numbers. Treatments will be based on site specific stand data as well as how that stand fits into the greater landscape. A diameter limit is not warranted in Mud Creek to maintain old growth for several reasons. First, old growth is measured at the stand scale, not individual tree diameter, and second, treatment should be based on stand and site characteristics, not overarching project-wide diameter limits. The final project area landscape, including treated and not treated stands, will provide a wide range of diversity in age classes, successional stages, stand structures, species compositions, and presence or absence of insects and disease (Draft EA and SILV-001).

Wildlife issues related to old growth were identified and analyzed in the Wildlife Effects Analysis Report (PF-WILD-001, pp. 39-45; PF-WILD-024, p. 22; and PF-WILD-025, pp. 24-25). The discussion above provides further comments regarding the proposed action in the draft EA (p. 33) with regard to old growth. The Forest recognizes the wildlife value that old growth provides for a number of avian and terrestrial species. Comments regarding sensitive species and Management Indicator Species (MIS) that are connected to old growth habitats are addressed in other sections of this document. Maintaining, enhancing, and/or increasing the resiliency of old growth stands in the project area will ensure habitat for these, as well as numerous other species on the Forest. (Draft DN Appendix B, pages 21, 22)

Commentary: The Agency declares:

> "The proposed action is designed to maintain and improve stand resilience to insects, disease, and fire in all old growth stands." (Draft DN Appendix B, page 21)

Yet no proof is offered that such actions accomplish what the FS claims.

> "Not all stands will be treated within the project area boundary. Only stands for which site-specific data indicates a departure from desired, resilient conditions will be proposed for treatment. In addition, no old growth stand will be removed from old growth status (as defined under the site-specific plan amendment) during commercial harvest." (Draft DN Appendix B, page 22)

There are two problems with those statements. First, the Final EA and associated documents provide no in-depth definition of "desired, resilient conditions," so it is impossible to deduce what "departure" means. Second, Green et al. define old growth as nothing more than trees. Ecologists understand that old-growth areas of forest are a complex mix of little understood ecosystems. Any management actions in that mix of ecosystems can destroy the complex relationships that exist. By focusing only on trees, the FS ignores complexity and causes damage.

> "It is important to note that while Green et al. (1992) and the Forest Plan provide minimum criteria for identifying old growth, that does not mean all stands will be treated and harvested to the minimum criteria numbers. Treatments will be based on site specific stand data as well as how that stand fits into the greater landscape. A diameter limit is not warranted in Mud Creek to maintain old growth for several reasons. First, old growth is

measured at the stand scale, not individual tree diameter, and second, treatment should be based on stand and site characteristics, not overarching project-wide diameter limits. The final project area landscape, including treated and not treated stands, will provide a wide range of diversity in age classes, successional stages, stand structures, species compositions, and presence or absence of insects and disease (Draft EA and SILV-001)." (Draft DN Appendix B, page 22)

Again, the FS focuses on tree size and age while discounting the complex ecosystems.

"Wildlife issues related to old growth were identified and analyzed in the Wildlife Effects Analysis Report (PF-WILD-001, pp. 39-45; PF-WILD-024, p. 22; and PF-WILD-025, pp. 24-25). The discussion above provides further comments regarding the proposed action in the draft EA (p. 33) with regard to old growth. The Forest recognizes the wildlife value that old growth provides for a number of avian and terrestrial species. Comments regarding sensitive species and Management Indicator Species (MIS) that are connected to old growth habitats are addressed in other sections of this document. Maintaining, enhancing, and/or increasing the resiliency of old growth stands in the project area will ensure habitat for these, as well as numerous other species on the Forest." (Draft DN Appendix B, page 22)

No on-the-ground monitoring results from past projects were offered to substantiate the Agency assertion that "Maintaining, enhancing, and/or increasing the resiliency of old growth stands in the project area will ensure habitat for these, as well as numerous other species on the Forest." [2]

In the case Ecology Center v. Austin[3], the Court held that "… the Forest Service's decision to treat old-growth violates, both NFMA and NEPA, … ." Specifically, the Court said:

"While Ecology Center does not offer proof that the proposed treatment causes the harms it fears, the Service does not offer proof that the proposed treatment benefits—or at least does not harm—old-growth dependent species. Ecology Center argues that because the Forest Service has not assessed the effects of old-growth treatment on dependent species, the Service cannot be reasonably certain that treating old-growth is consistent with NFMA's substantive mandate to ensure species diversity and viability. As a result, especially given the scientific uncertainty surrounding the treatment of old-growth stands, the Forest Service's decision to treat additional old-growth stands was arbitrary and capricious.

"The EIS did not address in any meaningful way the various uncertainties surrounding the scientific evidence" upon which the decision to treat the Lolo National Forest old-growth rests. Seattle Audubon Soc'y v. Espy, 998 F.2d 699, 704 (9th Cir. 1993). Although the EIS identifies the public's concerns regarding the impact of treatment on dependent species as "key" or "driving" issues, the EIS does not actually explain in any detail the bases of those concerns, much less address them. … The EIS discusses in detail only the Service's own reasons for proposing treatment, and it treats the prediction that treatment will benefit old-growth dependent species as a fact instead of

[2] Because the BNF admits using Green et al. for 30+ years, opportunities for monitoring should have existed.
[3] Ecology Center, Inc v. Austin, 9th Circuit, 2005, Case No. 03-35995

> an untested and debated hypothesis. Even if the Service considered these issues but concluded that it need not or could not "undertake further scientific study" regarding the impact of treatment on dependent species, it should have "explain[ed] in the EIS why such an undertaking [wa]s not necessary or feasible." Id. For these reasons, we also find that the Service's analysis of the impact of treating old-growth to be inadequate under NEPA."

Unless the FS produces monitoring from multiple past BNF projects which confirms the proposed old-growth treatments produce resilience to disturbance, this project is violating both NFMA and NEPA.

Statements such as "larger trees will be retained where appropriate" are vague. Non-specific declarations do not provide the information required for understanding Agency intentions.

Failure to amend the Forest Plan (1987) and use Green et al. for more than 30 years is arbitrary and capricious. Deficiencies in Green et al. have been exposed, including a lack of peer review, new field work, estimates for the range of variation in old growth, or criteria for evaluating old-growth quality. (Schultz, 1994) (Yanishevsky, 1994)

Green et al. includes only three quantifiable, per-acre measurements: age, size, and basal area. If the BNF wanted to accurately assess old growth using Green et al. as a basis, the Agency could have developed additional benchmarks as an alternative. For example, using Green et al. per-acre averages in old-growth ponderosa/Douglas fir stands, the Agency could have increased the tree numbers to 15, specified 6 snags, included a minimum for Coarse Woody Debris (CWD), established a minimum for broken-topped/hollow trees, etc. That did not happen.

Suggested Remedy: Given the current claim that the project-specific Green et al. amendment must be implemented, the FS has an obligation to justify why it neglected to update the Forest Plan for more than 30 years.

The Agency must produce monitoring from multiple past BNF projects which definitively confirms proposed old-growth treatments produce resilience to disturbance.

The FS must provide more exact, in-depth information about management activities it has planned for old-growth stands and what impact those activities may have on wildlife species that use old-growth habitat.

The Agency must provide the results of monitoring of past projects that substantiate its claims of "no harm" to wildlife.

The FS must justify its declaration that, proposed management actions in old-growth areas actually do maintain, enhance, and/or increase resilience of old-growth stands and, that those actions benefit wildlife habitat.

My Comment: 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 BNF. 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. (Oregon Department of Energy, 2018 Biennial Energy Report, 2018) (Harris, 2016). (DEA Comments, page 5)

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 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. (Baker W. L., 2018) (Buotte, 2019) (McNulty, 2014). (DEA Comments, page 5)

My Comment: 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. (Harris, 2016). Other research shows that logged forests sequester less carbon than untreated forests. (Campbell, 2012) (Wilson, 2020). 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. (DEA Comments, pages 9, 10)

Forest Service Response: The Forest Service recognizes that the forest plays a role in carbon storage that affects global climate change. Carbon stewardship is one of many aspects of multiple-use management in the project area. The proposed action is in line with the multi-agency, Northern Rockies Adaptation Partnership's recommended strategies to manage for the unknowns associated with the future climate through efforts to increase diversity and landscape resilience to future disturbances.

The Forest Carbon Assessment for the Bitterroot National Forest (CLIMATE-003) was completed April, 2021 and added to the Mud Creek project file and analysis. The Forest Service has used several models to produce estimates of carbon stocks in vegetation and soil in the Bitterroot National Forest. These models are currently the best available scientific information regarding carbon dynamics on the forest. The empirical data used to produce modeled estimates of carbon stocks and the effects of disturbances on carbon stocks are based on data from Forest Inventory and Analysis surveys.

The analysis was completed at the Regional scale and narrowed down to the Bitterroot National Forest scale, the smallest scale to which carbon cycling, emissions, and storage can reasonably be analyzed based on model resolution and available data. Model results are unavailable at the Mud Creek project scale.

The Forest Carbon Assessment found that wildfire is the greatest source of carbon storage reduction on the Bitterroot National Forest, having affected approximately 5% of the baseline inventory of forest-wide carbon stocks between 1990 and 2011, followed by root disease decay

and mortality (<2% of baseline carbon stocks), insect-related mortality (<1%), and finally, timber harvest (<1%). In the near term, the proposed action might contribute a small amount of change in the carbon balance however, carbon sequestration is cyclic in forests and carbon storage again increases as thinned stands increase in health and vigor, begin to grow, and new young stands establish. The Forest Service recognizes greenhouse gas (GHG) emissions tied to mechanical treatments and log haul however, carbon continues to be stored in wood products. Data is currently unavailable to analyze greenhouse gas emissions from harvest operations and other business operations at the project scale.

Please see chapter 3 of the Final Environmental assessment and the Forest Vegetation/Silviculture Report (PF-SILV-001) for detailed information on the Existing Condition of the Climate and Carbon (page 19) and the Effects of Treatment Activities on Climate and Carbon (page 50). PF-CLIMATE-001 and PFCLIMATE-003 provide further detail about the information used to describe the existing condition of carbon stocks. (Draft DN Appendix B, page 23)

Commentary: The FS response includes "The proposed action is in line with the multi-agency, Northern Rockies Adaptation Partnership's recommended strategies… ." The Northern Rockies Adaption Partnership's goal is explained as:

> "The Northern Rockies Adaptation Partnership is a science-management collaboration with the goal of assessing the vulnerability of natural resources and ecosystem services to climate change and developing science-based adaptation strategies." [4]

That goal is reactive not proactive. It is a plan to assess vulnerability to the effects of climate change but does nothing to assess what actions can be taken or eliminated to limit contributions to global warming. That is not only defeatist, but it also shirks each Agency's responsibility to reduce or minimize management actions that continue to contribute to global warming.

> "The future carbon balance in the boreal forest will largely depend on the type and frequency of disturbances, changes in species composition, and alterations to the nutrient and moisture regimes under changing climate conditions. It will also depend on forest management practices that affect both the disturbance regime and nutrient status." (Bhatti, 2003)
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> "Biodiversity metrics also need to be included when selecting preserves to ensure species-rich habitats that result from frequent disturbance regimes are not overlooked. The future impacts of climate change, and related pressures as human population exponentially expands, make it essential to evaluate conservation and management options on multi-decadal timescales, with the shared goals of mitigating committed CO_2 emissions, reducing future emissions, and preserving plant and animal diversity to limit ecosystem transformation and permanent losses of species." (Buotte, 2019)

[4] https://www.fs.usda.gov/pnw/projects/northern-rockies-adaptation-partnership-preparing-climate-change-through-science-management

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"Increasing cumulative carbon in forests is essential for keeping carbon dioxide out of the atmosphere. It has been found world-wide that forests hold half of the carbon in the largest 1% diameter trees (Lutz, 2018), and can store twice the carbon they do now (Erb, 2018). Increasing forest reserves and allowing forests to meet their ecological carbon storage potential (proforestation) are the most effective climate mitigation (Law B. E., Land use strategies to mitigate climate change in carbon dense temperate forests, 2018) (Moomaw, Intact Forests in the United States - Proforestation Mitigates Climate Change and Serves the Greatest Good, 2019). Letting forests grow and halting land conversions would bring carbon dioxide removal rates closer to current emission rates globally (Houghton, 2017)."

"Increased harvesting of forests does not provide climate change mitigation.

"Context of forest carbon emission sources - Harvest is the major source of forest emissions in the US. Across the lower 48 states, direct harvest-related emissions are 7.6 times higher than all-natural disturbances (e.g., fire, insects) combined (Harris, 2016). In the West Coast states (OR, CA, WA), harvest-related emissions average 5 times fire emissions for the three states combined (Hudiburg T. W., Meeting GHG reduction targets requires accounting for all forest sector emissions, 2019).

"There is absolutely no evidence that thinning forests increases biomass stored (Zhou, 2013). It takes decades to centuries for carbon to accumulate in forest vegetation and soils (Sun, 2004) (Hudiburg T. e., 2009) (Schlesinger, 2018), and it takes decades to centuries for dead wood to decompose.

"The current system where most forestlands are available for logging keeps too many trees at a smaller size that do not store much carbon. Providing incentives to lengthen rotation harvest cycles will increase carbon storage in production forests, and reduce atmospheric carbon dioxide." (Law B. E., The Status of Science on Forest Carbon Management to Mitigate Climate Change, 2020)

"The most favorable management regime for carbon storage/sequestration was "set-aside" followed by long rotation lengths and avoiding silvicultural thinning. These recommended management regimes are largely the same as those that have been promoted to maintain biodiversity in production forest landscapes [e.g., (Mönkkönen, Spatially dynamic forest management to sustain biodiversity and economic returns, 2014) (Mönkkönen, Cost-effective strategies to conserve boreal forest biodiversity and long-term landscape-level maintenance of habitats, 2011)]." (Triviño, 2015)

"Carbon stock losses associated with logging represent a much greater departure from natural disturbance in resprouting forests, because wildfire causes relatively little carbon loss in resprouting forests compared to non-resprouting forests. This analysis highlights the need to consider specific biological responses when assessing forest carbon stock losses

associated with disturbance. Consideration of these dynamics is essential in addressing carbon stock risk mitigation." (Wilson, 2020)

The Forest Carbon Assessment, only recently made available to the public, makes multiple assumptions based on modeling. Results from modeling are dependent upon the correctness of the data which makes those conclusions uncertain and never as reliable as data collected from on-the-ground research. In addition, long-held Agency assumptions related to carbon sequestration are questioned by recent research. (Buotte, 2019)

> "After outlining these assumptions, we conclude suggesting that many studies assessing forest management or products for climate change mitigation depend on a suite of assumptions that the literature either does not support or only partially supports." (Howard, 2021)
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> "We find that Western US forests are net sinks because there is a positive net balance of forest carbon uptake exceeding losses due to harvesting, wood product use, and combustion by wildfire. However, over 100 years of wood product usage is reducing the potential annual sink by an average of 21%, suggesting forest carbon storage can become more effective in climate mitigation through reduction in harvest, longer rotations, or more efficient wood product usage." (Hudiburg T. W., Meeting GHG reduction targets requires accounting for all forest sector emissions, 2019)

Declarations from the Forest Carbon Assessment include:

> "… 47.6% of the forest carbon stocks in the BNF are stored in the soil carbon contained in the organic material to a depth of one meter (excluding roots) and the forest floor. The aboveground portion of live trees, which includes all live woody vegetation at least one inch in diameter is the second largest carbon pool, storing another 30.5 percent of the forest carbon stocks." (CLIMATE-003, page 5)

The proposed management actions for this project will impact both above- and below-ground carbon stores. Thinning and logging will remove most of the above-ground carbon from the forest. (Smith, 2019). Those same actions together with road work will negatively impact below-ground ecosystems and carbon storage. Therefore, those management actions negatively affect the forest's ability to sequester carbon and are consequently unacceptable.

> "Our analysis found that a ''no timber harvest'' scenario eliminating harvests on public lands would result in an annual increase of 17–29 million metric tonnes of carbon (MMTC) per year between 2010 and 2050—as much as a 43% increase over current sequestration levels on public timberlands and would offset up to 1.5% of total U.S. GHG emissions. In contrast, moving to a more intense harvesting policy similar to that which prevailed in the 1980s may result in annual carbon losses of 27–35 MMTC per year between 2010 and 2050." (Depro, 2008)
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>
> "To meet any proposed climate goals of the Paris Climate Agreement (1.5, 2.0^{o} C, targets for reduced emissions) it is essential to simultaneously reduce greenhouse gas emissions from

all sources including fossil fuels, bioenergy, and land use change, and increase carbon dioxide removal (CDR) by forests, wetlands and soils. Concentrations of these gases are now so high that reducing emissions alone is insufficient to meet these goals.

"Globally, existing forests only store approximately half of their potential due to past and present management (Erb, 2018), and many existing forests are capable of immediate and even more extensive growth for many decades (Lutz, 2018). During the timeframe while seedlings planted for afforestation and reforestation are growing (yet will never achieve the carbon density of an intact forest), proforestation is a safe, highly effective, immediate natural solution that does not rely on uncertain discounted future benefits inherent in other options.

"Taken together, proforestation is a rapid and essential strategy for achieving climate and biodiversity goals and for serving the greatest good.

"…, proforestation provides the most effective solution to dual global crises—climate change and biodiversity loss. It is the only practical, rapid, economical, and effective means for atmospheric CDR among the multiple options that have been proposed because it removes more atmospheric carbon dioxide in the immediate future and continues to sequester it long-term." (Moomaw, Intact Forests in the United States - Proforestation Mitigates Climate Change and Serves the Greatest Good, 2019)

"Old forests were previously thought to be carbon neutral because maintenance (loss of carbon) would equal production (uptake of carbon) and thus evolve towards equilibrium with the atmosphere with increasing forest age. It has also been assumed that old forests would turn into sources of atmospheric carbon due to increased mortality of old trees damaged by external disturbances like fires, storms, or insects. However, evidence is accumulating that forests serve as carbon sinks far beyond normal harvesting age.

"Comparisons of forest stands of different ages also indicate that older forests have higher carbon stocks than younger forests. Although changes in soil or total ecosystem carbon stocks are difficult to monitor, and the various methods have their problems, the consistent direction of the results of the various studies provide convincing evidence that old forests function as carbon sinks for a long time. The carbon stocks in biomass of old forests continue to increase with age, possibly for several hundred years, although the rate of biomass accumulation and thus the carbon sink will decrease with increasing age. Also, carbon stocks of forest soil and dead organic matter (especially coarse woody debris) appear to increase with stand age.

"Generally, variation in soil carbon stocks with environmental drivers is most pronounced for the organic layer, less so for the mineral soil and total soil carbon stocks.

"The most fundamental effect comes with the removal of biomass from the forest, directly reducing the biomass carbon stocks. Harvesting produces considerable amounts of logging residue of various sizes. Most of it will be of small dimensions and decompose rather quickly over a decade or so, but stumps represent coarse woody debris with a slow decay

rate (lasting up to a century). The carbon from logging debris and natural litter production will partly be incorporated into the soil organic matter, and partly be released to the atmosphere as CO_2.

"Total carbon stocks in managed forests will increase with longer rotation period, less thinning and harvesting of logging debris and stumps, and management of regeneration sites to ensure rapid restocking of forest stands, such as site preparation, planting of productive species or provenances, and fertilization." (Framstad, 2013)

More than 200 Top U.S. Climate and Forest Scientists Urged Congress to protect forest to mitigate the climate crisis:

"… scientists conclude that, in order to avoid the worst impacts of the climate crisis, moving beyond fossil fuel consumption is not enough, and we must also increase forest protections and shift away from energy-intensive and greenhouse-gas polluting wood consumption.

"The scientists note that annual carbon emissions from logging in U.S. forests are comparable to emissions from the residential and commercial sectors combined.

"Most of the carbon in trees is removed from forests when they are logged and quickly ends up in the atmosphere or in landfills, they caution. The scientists also note that logging, including commercial "thinning," can often increase fire intensity in forests, while damaging soils and removing vital nutrients, which undermines the carbon sequestration and storage capacity of forests.

"Dr. Dominick DellaSala, Chief Scientist with the Geos Institute, added, 'The vast majority of scientists warn that in order to avoid catastrophic climate impacts in the decades ahead, including new pandemics potentially linked to deforestation, we need to keep dinosaur-carbon in the ground and store atmospheric carbon in forests.'

"The growing consensus of scientific findings is that, to effectively mitigate the worst impacts of climate change, we must not only move beyond fossil fuel consumption but must also substantially increase protection of our native forests in order to absorb more CO_2 from the atmosphere and store more, not less, carbon in our forests. (Depro, 2008) (Harris, 2016) (Erb, 2018) (Allen, 2018) (Law B. E., Land use strategies to mitigate climate change in carbon dense temperate forests, 2018) (Harmon, 2019) (Moomaw, Intact Forests in the United States - Proforestation Mitigates Climate Change and Serves the Greatest Good, 2019)

"Up to 40% of the harvested material does not become forest products and is burned or decomposes quickly, and a majority of manufacturing waste is burned for heat. One study found that 65% of the carbon from Oregon forests logged over the past 115 years remains in the atmosphere, and just 19% is stored in long-lived products. The remainder is in landfills (Hudiburg T. W., Meeting GHG reduction targets requires accounting for all forest sector emissions, 2019).

"Logging in U.S. forests emits 617 million tons of CO_2 annually (Harris, 2016). Further, logging involves transportation of trucks and machinery across long distances between the forest and the mill. For every ton of carbon emitted from logging, an additional 17.2% (106

million tons of CO_2) is emitted from fossil fuel consumption to support transportation, extraction, and processing of wood (Ingerson, 2007).

"The cumulative climate change impact of logging in the U.S. is even higher, since logging causes substantial reductions in carbon sequestration and storage potential in forests due to soil compaction and nutrient removal, and these combined impacts can often reduce forest carbon storage potential by 30% or more (e.g., (Elliott, 1996) (Walmsley, 2009).

"The wood products industry claims that substituting wood for concrete and steel reduces the overall carbon footprint of buildings. However, this claim has been refuted by more recent analyses that reveal forest industries have been using unrealistic and erroneous assumptions in their models, overestimating the long-term mitigation benefits of substitution by 2 to 100-fold (Law B. E., Land use strategies to mitigate climate change in carbon dense temperate forests, 2018) (Harmon, 2019). The climate impact of wood is even worse if the reduced forest carbon sequestration and storage caused by nutrient loss and soil compaction from logging is included, as discussed above.

"While small-tree thinning can reduce fire intensity when coupled with burning of slash debris [e.g., (Perry, 2004) (Dtrom, 2007)] under very limited conditions, recent evidence shows intensive forest management characterized by young trees and homogenized fuels burn at higher severity (Zald, 2018). Further, the extremely low probability [less than1%, (Schoennagel, 2017)] of thinned sites encountering a fire where thinning has occurred limits the effectiveness of such activities to forested areas near homes. Troublingly, to make thinning operations economically attractive to logging companies, commercial logging of larger, more fire-resistant trees often occurs across large areas.

"Importantly, mechanical thinning results in a substantial net loss of forest carbon storage, and a net increase in carbon emissions that can substantially exceed those of wildfire emissions (Hudiburg T. W., Evaluation and improvement of Community Land Model (CLM4) in Oregon forests, 2013) (Campbell, 2012). Reduced forest protections and increased logging tend to make wildland fires burn more intensely (Bradley, 2016). This can also occur with commercial thinning, where mature trees are removed (Cruz, Development of a model system to predict wildfire behaviour in pine plantations, 2008) (Cruz, Using Modeled Surface and Crown Fire Behavior Characteristics to Evaluate Fuel Treatment Effectiveness: A Caution, 2014). As an example, logging in U.S. forests emits 10 times more carbon than fire and native insects combined (Harris, 2016). And, unlike logging, fire cycles nutrients and helps increase new forest growth. (Moomaw, Over 200 Top U.S. Climate and Forest Scientists Urge Congress: Protect Forests to Mitigate Climate Crisis, 2020)

"Changes in forest carbon due to mechanical fuel treatment (thinning from below to reduce ladder fuels) and prescribed fire were explored, as well as changes in expected fire behavior and effects of subsequent wildfire. Results indicated that fuel treatments decreased fire severity and crown fire occurrence and reduced subsequent wildfire emissions, but did not increase post-wildfire carbon stored on-site. Conversely, untreated stands had greater wildfire emissions but stored more carbon." (Reinhardt E. D., 2010)

“Protecting forest ecosystems is critical in the fight to limit global warming — when forests are disturbed they release carbon, but when left to grow they actively pull carbon out of the air and store it. When left standing, forests also provide optimal natural protection against extreme weather events, like flooding and droughts.

“Carbon emissions from logging in the U.S. are 10 times higher than the combined emissions from wildland fire and tree mortality from native bark beetles.

“Fire only consumes a minor percentage of forest carbon, while improving availability of key nutrients and stimulating rapid forest regeneration. Within a decade after fire, more carbon has been pulled out of the atmosphere than was emitted.

“When trees die from drought and native bark beetles, no carbon is consumed or emitted initially, and carbon emissions from decay are extremely small, and slow, while decaying wood helps keeps soils productive, which enhances carbon sequestration capacity over time.

“On the other hand, industrial logging — even when conducted under the euphemism of “thinning” — results in a large net loss of forest carbon storage, and a substantial overall increase in carbon emissions that can take decades, if not a century, to recapture with regrowth. Logging also tends to make fires burn faster and more intensely while degrading a forest ecosystem’s ability to provide natural protections against extreme weather events.” (Smith, 2019)

“The most favorable management regime for carbon storage/sequestration was “set-aside” followed by long rotation lengths and avoiding silvicultural thinning. These recommended management regimes are largely the same as those that have been promoted to maintain biodiversity in production forest landscapes (e.g., (Mönkkönen, Cost-effective strategies to conserve boreal forest biodiversity and long-term landscape-level maintenance of habitats, 2011) (Mönkkönen, Spatially dynamic forest management to sustain biodiversity and economic returns, 2014).” (Triviño, 2015)

“Deforestation and forest degradation (thinning) are the second largest source of anthropogenic GHG emissions.

“Thinning forests to reduce potential carbon losses due to wildfire is in direct conflict with carbon sequestration goals, and, if implemented, would result in a net emission of CO_2 to the atmosphere because the amount of carbon removed to change fire behavior is often far larger than that saved by changing fire behavior, and more area has to be harvested than will ultimately burn over the period of effectiveness of the thinning treatment.” (Law B. E., 2011)

"… , we find that thinning existing forests to reduce crown-fire risk increases net carbon emissions to the atmosphere for many decades, … ." (Law B. E., 2014)

The Forest Carbon Assessment goes on to state:

"…, the trend of relatively steady carbon stocks from 1990 to 2013 (Fig. 1) over the 23-year period suggests that the Bitterroot NF are neither a carbon source nor a carbon sink. Carbon stocks have been relatively stable over the 23-year period." (CLIMATE-003, page 6)

The document insinuates that such a trend is acceptable. It does not mention that the forest could sequester additional carbon. No mention is made of the negative impact on carbon storage by current management actions.

"When the loss of carbon associated with wood products manufacturing is factored in, it is highly unlikely that harvesting carbon and placing it into wood products will increase carbon stores in the overall forest sector.

"Carbon is always lost as wood products are used or disposed, which means release of CO_2 to the atmosphere. Since long-term storage in forest products saturates over time (i.e., eventually does not increase), the effect of substituting wood for fossil fuel energy also saturates.

"Managing forest carbon should consider other ecosystem values and services, and ecosystem sustainability in the face of climate change, allowing for natural adaptation to climate change (e.g., landscape connectivity for migration and minimizing impacts of management on species ability to survive in a new climate)." (Law B. E., 2011)

"Harvest residue bioenergy use did not reduce short-term emissions.

"Utilizing harvest residues for bioenergy production instead of leaving them in forests to decompose increased emissions in the short-term (50 y), reducing mitigation effectiveness. Increasing forest carbon on public lands reduced emissions compared with storage in wood products because the residence time is more than twice that of wood products." (Law B. E., Land use strategies to mitigate climate change in carbon dense temperate forests, 2018)

The Forest Carbon Assessment asserts:

"Most national forests in the Northern Region have experienced increasing carbon densities from 1990 to 2013. Carbon density in the Bitterroot NF has been similar but slightly lower than the average for all national forest units in the Northern Region (Fig.4)." (CLIMATE-003, page 7)

What Figure 4 (CLIMATE-003, page 7) actually shows is, while most forest in the Northern Region experienced increasing carbon densities, the BNF experienced decreasing densities. Although no explanation is offered for those trends, the document states "All results reported in this assessment are estimates that are contingent on models, data inputs, assumptions, and uncertainties." That statement is an explicit admission the claimed results are suspect.

The Forest Carbon Assessment alleges:

> "Although harvest transfers carbon out of the forest ecosystem, most of that carbon is not lost or emitted directly to the atmosphere. Rather, it can be stored in wood products for a variable duration depending on the commodity produced. Wood products can be used in place of other more emission intensive materials, like steel or concrete, and wood-based energy can displace fossil fuel energy, resulting in a substitution effect (Gustavsson et al., 2006; Lippke et al., 2011). Much of the harvested carbon that is initially transferred out of the forest can also be recovered with time as the affected area regrows." (CLIMATE-003, page 8)

Proclamations such as those are misleading. Recent research indicates the timber industry and the Forest Service have been grossly overestimating the amount of carbon stored in wood products. (Harmon, 2019) (Law B. E., 2011) (See also Appendix A). The Forest Carbon Assessment even agrees, stating "As with the baseline estimates of ecosystem carbon storage, the analysis of carbon storage in Harvested Wood Products (HWP) also contains uncertainties." (CLIMATE-003, page 9)

The Forest Carbon Assessment contends:

> "Fire on the Bitterroot NF was the primary disturbance influencing carbon stocks from 1990 to 2011… ." (CLIMATE-003, page 12)

There is disagreement among scientists concerning which disturbance has the greatest impact on forest carbon sequestration. Numerous researchers found that, on an annual basis, logging emits significantly more atmospheric carbon than wildfires. (Harris, 2016) (Hicke, 2013) (Howard, 2021) (Smith, 2019) (Wilson, 2020) (Stenzel, 2019) (Law B. E., Land use strategies to mitigate climate change in carbon dense temperate forests, 2018) (See also Appendix A)

The Forest Carbon Assessment maintains:

> "The rate of carbon uptake and sequestration generally decline as forests age." (CLIMATE-003, page 22)

There is a considerable level of controversy in the scientific community about that claim. The Forest Carbon Assessment did not include on-the-ground evidence to support that statement and there is a substantial amount of research that refutes it.

> "Large-diameter trees store disproportionally massive amounts of carbon and are a major driver of carbon cycle dynamics in forests worldwide. In the temperate forests of the western United States, proposed changes to Forest Plans would significantly weaken protections for a large portion of trees greater than 53 cm (21 inches) in diameter (herein referred to as "large-diameter trees") across 11.5 million acres (~4.7 million ha) of National Forest lands.
>
> "We analyzed forest inventory data collected on 3,335 plots and found that large trees play a major role in the accumulated carbon stock of these forests. Tree AGC (kg) increases sharply with tree diameter at breast height (DBH; cm) among five dominant tree species. Large trees accounted for 2.0 to 3.7% of all stems (DBH 1" or 2.54 cm) among five tree species; but held 33 to 46% of the total AGC stored by each species. Pooled across the five

dominant species, large trees accounted for 3% of the 636,520 trees occurring on the inventory plots but stored 42% of the total AGC.

"Given the urgency of keeping additional carbon out of the atmosphere and continuing carbon accumulation from the atmosphere to protect the climate system, it would be prudent to continue protecting ecosystems with large trees for their carbon stores, and also for their co-benefits of habitat for biodiversity, resilience to drought and fire, and microclimate buffering under future climate extremes.

"Conducting a quantitative assessment using empirical data has determined the large carbon stock that would be lost and the resulting climate consequences if these large trees are harvested.

"Proforestation allows existing forests to continue growing without harvest or other management practices so that more trees can reach the large tree size that accumulates more carbon in the near and long term than do reforestation and afforestation (Moomaw, Intact Forests in the United States - Proforestation Mitigates Climate Change and Serves the Greatest Good, 2019).

"In fire-prone forests such as in our study area, a diameter limit strikes the balance between protecting the most fire-resistant trees that store the most carbon and allowing fuels reduction with reintroduction of fire in dry biophysical environments. Intact mesic forests are ideal locations for proforestation. Harvesting large trees will add very large amounts of biogenic carbon to the atmosphere (Harris, 2016), … .

"The young trees will never be able to recover and accumulate the amount of carbon that is in the growing and older forests during these next critical decades, and will only equal current levels a century or more from now.

"Protecting large trees to help stabilize climate is critically important for managing forest ecosystems as social-ecological systems." (Mildrexler, 2020)

"…, large, old trees do not act simply as senescent carbon reservoirs but actively fix large amounts of carbon compared to smaller trees; at the extreme, a single big tree can add the same amount of carbon to the forest within a year as is contained in an entire mid-sized tree. The apparent paradoxes of individual tree growth increasing with tree size despite declining leaf-level and stand-level productivity can be explained, respectively, by increases in a tree's total leaf area that outpace declines in productivity per unit of leaf area and, among other factors, age-related reductions in population density. Our results resolve conflicting assumptions about the nature of tree growth, inform efforts to understand and model forest carbon dynamics, and have additional implications for theories of resource allocation and plant senescence." (Stephenson, 2014)

The Agency assertion that the forest must be managed (e.g., thinned and logged) to increase resilience to future disturbance and improve carbon storage is also repudiated. (Law B. E., 2021)

> "Compared with other terrestrial ecosystems, forests store some of the largest quantities of carbon per surface area of land." Much of the carbon stored is within the soils, with a smaller part in the vegetation. Forest management can modify soil organic carbon stocks. For example, conventional harvests like clearcutting or shelterwood cutting cause soils to lose organic carbon which is not the case for soils in unharvested forests. Not only does it lose the carbon stored in the soils, but cutting trees eliminates the trees' potential to continue to sequester carbon.
>
> "Our study showed that, compared with conventional stem-only harvest, removing the stem plus the harvesting residues generally increases nutrient outputs thereby leading to reduced amounts of total and available nutrients in soils and soil acidification, particularly when foliage is harvested along with the branches. Losses of available nutrients in soils could also be explained by reduced microbial activity and mineralization fluxes, which in turn, may be affected by changes in organic matter quality and environmental conditions (soil compaction, temperature, and moisture). Soil fertility losses were shown to have consequences for the subsequent forest ecosystem: tree growth was reduced by 3–7% in the short or medium term (up to 33 years after harvest) in the most intensive harvests (e.g., when branches are exported with foliage). Combining all the results showed that, overall, whole-tree harvesting has negative impacts on soil properties and trees that may have an impact on the functioning of forest ecosystems." (Achat, 2015)

The FS is purposefully ignoring the amount of Greenhouse Gasses emitted during management actions, especially logging and thinning.

> "We found that emissions have been underestimated by up to 55% in Oregon and 25% in Washington, and that at present, these emissions are not reported in state GHG reporting guidelines." (Hudiburg T. W., Meeting GHG reduction targets requires accounting for all forest sector emissions, 2019)

Issued on August 1, 2016, this directive from Executive Office of the President, Council on Environmental Quality has been reimplemented as national direction. [*See* 86 Fed Reg. 10252 (Feb. 19, 2021).]

2016 CEQ guidance acknowledges, "changes in our climate caused by elevated concentrations of greenhouse gases in the atmosphere are reasonably anticipated to endanger the public health and public welfare of current and future generations." It directs federal agencies to consider the extent to which a proposed action, such as this Mud Creek project, would contribute to climate change. It rejects as inappropriate any notion that this project is of too small a scale for such consideration:

> "Climate change results from the incremental addition of GHG emissions from millions of individual sources, which collectively have a large impact on a global scale. CEQ recognizes that the totality of climate change impacts is not attributable to any single action, but is exacerbated by a series of actions including actions taken pursuant to decisions of the Federal Government. Therefore, a statement that emissions from a proposed Federal action represent only a small fraction of global emissions is essentially a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding

whether or to what extent to consider climate change impacts under NEPA. Moreover, these comparisons are also not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigations because this approach does not reveal anything beyond the nature of the climate change challenge itself: the fact that diverse individual sources of emissions each make a relatively small addition to global atmospheric GHG concentrations that collectively have a large impact."[5]

The FS must quantify GHG emissions. The agency can only use a qualitative method if tools, methodologies, or data inputs are not reasonably available. If that is the case, there needs to be rationale as to why a quantitative analysis is not warranted. However, quantitative tools are readily available, so the FS must comply.[6]

Part of the response to my comments included:

"The Forest Service recognizes greenhouse gas (GHG) emissions tied to mechanical treatments and log haul however, carbon continues to be stored in wood products. Data is currently unavailable to analyze greenhouse gas emissions from harvest operations and other business operations at the project scale." (Draft DN Appendix B, page 23)

Declaring that "carbon continues to be stored in wood products" infers that a large amount of carbon is stored. Nothing could be further from the truth. Only 15% of the carbon in a living tree is estimated to remain stored in "wood products." (See Appendix A). And the Agency conveniently ignores the amount of carbon and greenhouse gases discharged into the atmosphere during the multiple processes required to extract wood products from trees by declaring "Data is currently unavailable to analyze greenhouse gas emissions from harvest operations and other business operations at the project scale."

The FS employs a significant number of scientists who have long understood the Agency's management actions contribute to global warming. For FS management to continue the pretense that "data is in not available" is dangerous and detrimental to the longevity of both the Agency and humanity. People at every level of government in multiple nations acted as if such assertions were acceptable or politically expedient. That is what has allowed global warming to reach the crisis stage. The just-released IPCC 2021 report stresses that "business as usual" is not only unacceptable but lethal. (Change, 2021)

By refusing to acknowledge that management actions contribute to global warming, the Agency continues its long-term habit of "future discounting." [7]

Judging by its actions—the refusal to act as if global warming is not extremely important—the Agency is a huge, bureaucratic, global-warming denier.

[5] Fed Reg. 10252 (Feb. 19, 2021) - https://www.govinfo.gov/content/pkg/FR-2021-02-19/pdf/2021-03355.pdf
[6] Greenhouse Gas (GHG) Accounting Tools - https://ceq.doe.gov/guidance/ghg-accounting-tools.html
[7] Minimizing a value received in the future (e.g., 1, 10, or even 100 years from now) to a value received immediately.

Suggested Remedies: The BNF must stop business as usual, be proactive, and discontinue management actions which have the potential to reduce the forest's ability to sequester carbon.

No management actions should be performed that increase greenhouse gas emissions.

Using the most recent scientific research, please justify the Agency assertion that fire rather than management actions (logging/thinning) is the primary contributor to carbon emissions.

The FS must discontinue the disproven claim that large amounts of carbon are sequestered in wood products.

Using the latest scientific research, justify the Agency's worn-out assertion that, on an annual basis, old trees (called mature and over-mature trees by silviculturists) store less carbon than young trees.

To maximize carbon sequestration, no "mature or over-mature trees" should be removed from the forest.

My Comment: 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." (Hadfield, 2000)

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." (Hadfield, 2000)

The fact that the FS insists in this Draft EA on reducing/eradicating dwarf mistletoe gives substance to the widely held belief that the focus of this project is timber production even when detrimental to certain wildlife species. (DEA Comments, page 3)

Forest Service Response: The Forest Service is not trying to eradicate dwarf mistletoe. Large areas of mistletoe infected stands will remain in untreated stands within the project area and surrounding area offering diversity across the landscape. Where treatment units have been identified, treatments will favor healthy trees to reduce the risk of fire (highly flammable brooms) and insects attracted to mistletoe stressed trees. Additionally, priority will be made to grow healthy new age-classes for future forests. Mistletoe affects regeneration and prevents heavily infected young trees from reaching maturity. See Forest Vegetation/Silviculture Report (PF-SILV-001) starting on page 30, including table 6 on page 47.

Please refer to the Forest Vegetation/Silviculture Report (PF-SILV-001) for a discussion of desired forest condition as it relates to insects. Starting on page 22, the report provides

discussion, hazard ratings, and aerial detection survey maps for some of the insects found in the project area. Specific stands and treatments will be identified during the implementation process, as described in Appendix B of the environmental assessment. A review of literature pertaining to the effect of insect outbreaks on fuels and fire behavior can be found beginning on page 38 of the Fire & Fuels specialist report. (Draft DN Appendix B, pages 25, 26)

Commentary: The FS response declares they are not attempting to eradicate dwarf Mistletoe. However, the response states:

> "Where treatment units have been identified, treatments will favor healthy trees to reduce the risk of fire (highly flammable brooms) and insects attracted to mistletoe stressed trees. Additionally, priority will be made to grow healthy new age-classes for future forests. Mistletoe affects regeneration and prevents heavily infected young trees from reaching maturity."

In other words, because the Agency wants to grow "healthy new age-class" trees (unsaid but implied, for the timber industry), trees with mistletoe infestations will be removed except in areas the project is not treating.

Trees with mistletoe infestations do not grow quickly enough for the timber industry so are classified as "unhealthy." Although a necessary component of healthy, balanced, forest ecosystems and important wildlife habitat, an illogical "unhealthy" classification justifies removal.

Suggested Remedy: The FS must accept forests as a complicated mix of uncountable ecosystems and accept mistletoe as a natural and necessary component.

My Comment: 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 in order to persuade the public that logging and thinning the BNF (even in the WUI) will reduce risk. (DellaSala D. A., 2019)

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. (Bradley, 2016) (Erb, 2018)

My Comment: While there are certain risks to people from wildfires, scientific studies show that forests most often benefit ecologically from mixed-severity wildfires. (DellaSala D. A., Flight of the Phoenix: Coexisting with Mixed-Severity Fires, 2015) 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. (DellaSala D. A., Flight of the Phoenix: Coexisting with Mixed-Severity Fires, 2015) It is logging and suppression before, during, and after such natural

occurrences that have the biggest impact on water quality and quantity, wildlife, and natural processes. (DEA Comments, page 5)

Forest Service Response: A desired outcome of implementing activities proposed by this project is to increase the ability to utilize fire (wildfire or prescribed) on the landscape to maintain natural processes and create landscape diversity while minimizing impacts to onsite or adjacent values susceptible to mixed or stand replacing fire. To meet that goal, we need ecosystems and communities that are resilient to fire. The current vegetation and fuel conditions, potential fire behavior and lack defensible control features within the project area limit the ability to allow natural fires to burn because the risk of negative outcomes to fire susceptible values on national forest lands and within the surrounding community is high (Wildfire Risk Assessments BRF 2016 see project file PF-Fire-004); (Montana DNRC 2020), (USDA FS 2020 - https://wildfirerisk.org/)). The project incorporates principles from (Hessburg, 2015) about scale and heterogeneity into project planning, development, and implementation. Implementation of the proposed action will increase forest structure and diversity and reduce fuel continuity, increasing the ability to utilize fire on the landscape.

Implementation of the Mud Creek project will increase opportunities for allowing natural fire to play its ecological role within the adjacent Selway-Bitterroot, Frank Church River of No Return Wildernesses and Blue Joint Wilderness Study Area. This is due to a decreased transfer of risk and increased opportunities the treated areas will provide for containing a fire prior to reaching values at risk. However, fire suppression activities still need to occur within the project area to protect timber, wildlife habitat, visuals, and private property as directed by the Forest Plan and the Montana DNRC offset agreement for protection of private lands.

The interdisciplinary team recognizes that mixed and stand replacing fire is a natural disturbance process in some forest types found in the Mud Creek project and on the Bitterroot National Forest. Mixed and stand replacing fire was historically typical in areas identified as Fire Regimes III-V which only comprise <25% of the project area. We desire to have fire as part of those systems where appropriate when negative impacts to other onsite and adjacent values can be mitigated. (Draft DN Appendix B, page 30)

Commentary: For several years, the Agency has claimed wildfires should be allowed to burn. Yet, when wildfire ignites anywhere on the BNF, firefighters are immediately sent to put it out—the 2021 fire season is a perfect example. Allegedly because they are burning too near areas inhabited by humans, even when that stretches the facts. For example, during the 2021 fire season (which is not yet complete) the Agency even extinguished wildfires that started in wilderness or other places far removed from human structures.

> "Allowing wildfire to burn instead of managing the forest is not a viable option in the project area due to scattered private property and homes within and adjacent to the project area. Fire is not a precise tool and it does not recognize property boundaries or public safety efforts." (Draft DN Appendix B, page 19)

If the Agency is serious about allowing wildfires to burn it must stop suppressing them. Declaring the project is mostly in the WUI is misleading. The project area is far removed from any "urban" development and is rural with human structures widely spaced. People who

decided to live in a fire-prone area have the responsibility to harden structures and thin the HIZ to protect their property.

Suggested Remedy: The Agency must commit substantial resources to educate the public and local politicians about wildfire, specifically, that it is a natural part of western ecosystems, and that building location and hardening are the best defense against property loss.

My Comment: Fuel treatments more than 100 feet from structures have a negligible if any effect on the likelihood a structure will survive wildfire. (Cohen, An examination of home destruction - Roaring Lion Fire, 2016) (Cohen, An Analysis of Wildland Urban Fire with Implications for Preventing Structure Ignitions, 2019). A structure's chance of survival depends almost entirely upon its composition. This suggests that much of the treatment proposed for the Wilderness-Urban Interface (WUI) is not only unnecessary but suggests the reason is to substantially increase the area of logging activity. (DEA Comments, page 7)

My Comment: 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. (Cohen, An examination of home destruction - Roaring Lion Fire, 2016) (Cohen, An Analysis of Wildland Urban Fire with Implications for Preventing Structure Ignitions, 2019). (DEA Comments, pages 4, 5)

Forest Service Response: It is well understood and supported that the immediate area surrounding a home and the characteristics of the building material are potentially the most critical elements in determining its survivability. We encourage homeowners to do their part in making their homes fire safe, however, hardening structures on private land is beyond the scope and scale of this project. While individual home-by-home treatments can help reduce the risk of loss of individual homes, relying solely on such treatments would forego strategic opportunities for reducing fire behavior and controlling fires within this wildland urban interface area prior to fire impacting structures. Additionally, reducing fire behavior and the potential for torching within the WUI will also reduce the potential for lofted firebrands which are also a principle ignition factor for structures. Firebrands that result in ignitions can originate from wildland fires that are a distance of 1 kilometer (0.6 miles) or more (Cohen 2000).

In addition, although homes in the path of a wildfire are perhaps the most immediately recognized value at risk, research has determined that treatments need to go beyond the home ignition zone for other resource values (Graham, 2004). While changing fire behavior in the WUI to improve firefighter and public safety, protect values, and increase probabilities of

success during suppression are important outcomes from the proposed treatments, increasing landscape diversity, increasing resilience to fire, and preventing the loss of key ecosystem components from fire effects that are predicted to be outside of historic characteristics for low/mixed fire regimes are just as important results.

Some private land-owners have taken the initiative to reduce fuels on their own or through contract resources partially funded by the Resource Conservation and Development (RC&D) grant program. This has mostly involved thinning small trees or removing dead and dying trees followed by pile burning of the slash. These actions have improved conditions within the home ignition zone for some individual structures but the majority are still at high risk (wildfirerisk.org, (Montana Department of Natural Resources 2020). The exact location and amount of private land fuel reduction treatments outside of the RC&D program are unknown. These actions will have a beneficial effect on individual structure survivability during a wildlife. When combined with adjacent treatments on National Forest System land, private land treatments will cumulatively increase the strategic opportunities for reducing fire behavior and controlling fires within this wildland urban interface area prior to fire impacting structures. (Draft DN Appendix B, page 31)

Commentary: Graham et al. 2004 is old research which implies that forests must be thinned/logged to protect the remaining trees and to increase the safety of firefighters. Using Cohen 2000 as a reference to suggest firebrand ignitions can happen 1 kilometer or more from a wildfire misrepresents his findings. He suggested in that and subsequent research, it is the combustibility of structures that determines whether they will burn. His research of the results of the Roaring Lion Fire confirmed that the structures which were hardened (fewer combustible materials and clearing the HIZ) did not burn as opposed to unhardened structures which did. (Cohen, An examination of home destruction - Roaring Lion Fire, 2016)

According to recent research, thinning and logging in the WUI often increases windspeed during wildfire and reduces the ability of the area to sequester carbon. It does not protect unhardened buildings from ignition. (Atchley, 2021) (Campbell, 2012) (Naficy, 2010) (Banerjee, 2020) (Bradley, 2016) (Cruz, Using Modeled Surface and Crown Fire Behavior Characteristics to Evaluate Fuel Treatment Effectiveness: A Caution, 2014) (DellaSala D. A., Logged forests across the west burn at higher severities compared to protected forests, 2016) (Lindenmayer, 2020) (Moomaw, Intact Forests in the United States - Proforestation Mitigates Climate Change and Serves the Greatest Good, 2019) (Prichard, 2020) (Reinhardt E. D., 2008) (Russell, 2018) (Shen, 2019) (Stone, 2004) (Thompson, 2007) (Zald, 2018)

As long as the FS, at the behest of the timber industry, continues to sell logging projects to the public as protection from wildfire, many property owners will not take steps necessary to harden personal properties. The Agency is teaching people its activities will protect the public; consequently, people are likely to ignore personal responsibility for their own safety.

Suggested Remedy: The Agency must stop promising the public it can and will save private property by thinning/logging public lands. That management practice must be removed from this project.

My Comment: 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 promote 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. (Meigs, 2016)

Other research by Hart, S.J. et al. (2015) revealed that widespread and severe insect infestation restrict subsequent invasions. (Hart S. J., Negative feedbacks on bark beetle outbreaks: widespread and severe spruce beetle infestation restricts subsequent infestation, 2015). 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. (Meigs, 2016) (Hart S. J., Area burned in the western United States is unaffected by recent mountain pine beetle outbreaks, 2015)

Weather, not insects, is what determines wildfire behavior. (Hart S. J., 2020). (DEA Comments, page 2)

My Comment: 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 by previous FS management actions that (ironically) must now be overcome using current FS management activities.

Those FS claims related to the history of wildfire rely 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. (Arno, 1976)

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.

As shown by numerable studies, the frequency and severity of wildfire is driven mostly by climate (high temperature, drought, and wind) and not by the availability of fuels. (Hart S. J., 2020) (Abatzoglou, 2016) (Atchley, 2021)

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. (Bradley, 2016). (DEA Comments, pages 3, 4)

Forest Service Response: The fire and fuels specialist report (PF-FIRE-001, pp. 16-20) describes historical fire occurrence data and fire regimes and provides a literature review to support the purpose and need for the project. Portions of the project area would have burned more or less frequently than the mean fire free period, as well as at varying intensities and this would have had different effects to the vegetation, fuels, and landscape diversity. Ponderosa pine and dry Douglas-fir comprise 68% of the forest vegetation within the Mud Creek project area. Local research efforts suggest that historically, fires in these forest types would have burned frequently and generally at low to moderate intensities. Variability in fire intensities likely depended on fuel continuity and weather conditions which resulted in mosaic burn patterns and landscape diversity. A comprehensive literature review conducted by the Fire Effects Information System (FEIS) of wildland fire interactions with ponderosa pine communities within the Northern Rockies shows that low to moderate surface fire typically burned every 6-13 years (Fryer 2016). These findings are similar to the site specific results Arno found on the Bitterroot National Forest (Arno 1976), (Arno and Peterson 1983) as well as others (Barrett et al. 1997); (Arno et al. 1995); (Agee 1993); (Fischer and Bradley 1987); (Arno and Gruell 1986); (Habeck 1976); (Habeck and Mutch 1973); and (Bernhard Leiberg 1899).

Regardless of the exact historical fire return interval, fire suppression has been occurring during the past 130 years. Since 1986 there have been 192 fires suppressed within the Mud Creek project area. Suppression has limited the amount of fire on the landscape resulting in increased vegetation and fuel accumulations. In addition, the anticipated effects of climate change on fire frequency and severity highlights the need to have forests that are resilient to increased fire disturbances on the landscape. Refer to the Fire/Fuels Report (PF-FIRE-001, page 66) for the effects of climate change on recent fire seasons in the West.

The majority of stands proposed for treatment in the Mud Creek project have had varying levels of harvest at some point in the past and are located within the WUI where fuels reduction is one of the primary goals. Treatments will be designed to promote fire tolerant species, retain the largest healthy trees, reduce stand densities, increase canopy base heights, diversify stand structure, and promote landscape diversity. Opportunities to use less intensive management prescriptions to meet the desired conditions such as prescribed fire, will be evaluated for stands that are previously unlogged and fire excluded.

Refer to the fuels/fire specialist report in the project file (PF-FIRE-001) for descriptions of fire types. Maps displaying the existing and post treatment fire type are also located on pages 43 and 60 within the Fire/Fuels report (PF-FIRE-001). Passive and active are both types of crown fire and the fire effects and implications during fire suppression can be similar.

Due to the scale and lack of site-specific information on casual relationships it is difficult to apply information about insect outbreak effects on fire risk or severity to the project scale. The Mud Creek project does not contend that wildfires are likely to burn more severely because of insect outbreaks. Outbreaks do, however, have effects on fire behavior, as discussed in the fire and fuels specialist report (PF-FIRE-001). Additionally, the project area is not currently experiencing a mountain pine beetle outbreak although areas are currently at high risk to future activity. Local observations of fire behavior in areas impacted by western spruce bud-worm indicate increased potential for torching due to low live foliar moisture caused by stress.

The 2018 Reynolds Lake Fire (on the southern end of the West Fork Ranger District) quickly transitioned into the crowns under moderate early season conditions. (Draft DN Appendix B, pages 33, 34)

Commentary: Substantial disagreement exists over the frequency and severity of historic wildfire in the BNF. More scientists now contend that past methods used to estimate fire frequency and severity produced unverifiable data.

The FS response to my previous comment included:

> "A comprehensive literature review conducted by the Fire Effects Information System (FEIS) of wildland fire interactions with ponderosa pine communities within the Northern Rockies shows that low to moderate surface fire typically burned every 6-13 years (Fryer 2016)." [8]

Relying on a review of existing literature which reported results from methods that have been questioned, does nothing more than repeat questionable data. Rather than assume old research was correct, the FS should be conducting research that relies on improved methods. (Baker W. a., 2001) (Odion, 2014) (Stone, 2004) (Stephens, 2012)

The above response declares:

> "Since 1986 there have been 192 fires suppressed within the Mud Creek project area."

Without access to the complete information about those fires and the related suppression activities, the public can reach no logic-based conclusions.

The response states:

> "…, the anticipated effects of climate change on fire frequency and severity highlights the need to have forests that are resilient to increased fire disturbances on the landscape."

Implied in that statement is the assumption that the proposed management actions in the project area will ensure the forest is more "resilient to increased fire disturbances on the landscape." Without providing data from the monitoring similar past project there is no proof that the proposed management actions will achieve "more resilience." (Lydersen, 2014) (Zald, 2018)

Included in the above response is:

> "Treatments will be designed to promote fire tolerant species, retain the largest healthy trees, reduce stand densities, increase canopy base heights, diversify stand structure, and promote landscape diversity."

That statement is problematic. Because the project is condition-based, the public must accept the Agency will properly design treatments. However, the following phrase "promote fire tolerant species, retain the largest healthy trees, reduce stand densities, increase canopy base heights, diversify stand structure, and promote landscape diversity" contradicts itself. How can stand densities be reduces while retaining the largest healthy trees? How is a tree determined to be "healthy?" Can stand structure be diversified while retaining the largest healthy trees?

[8] Fire regimes of Northern Rocky Mountain ponderosa pine communities - https://www.fs.fed.us/database/feis/fire_regimes/Northern_RM_ponderosa_pine/all.html

Will some large healthy trees be sacrifices to attain landscape diversity? These questions are unanswered.

The Agency response to my comments refers to the "fuels/fire specialist report in the project file (PF-FIRE-001)." I have read that report and have comments related to fuel loading and firefighter safety.

The paragraph under Fuel Loading is particularly revealing.

> "Fuel loadings vary widely throughout the project area. In general many of the areas proposed for treatment exceed their historic ranges for fuel loadings based on the fire groups present in the project area. Most of the tonnage is in the form of large woody material greater than 3 inches in diameter. As mentioned in the fire history section, the majority of the area hasn't been affected by fire for over 100 years. Missed fire return intervals have allowed for natural fuels to accumulate above historical ranges. Since the early 1930s, fire suppression programs in the United States and Canada successfully reduced wildland fires in many Rocky Mountain ecosystems. This lack of fires has created forest and range landscapes with atypical accumulations of fuels that pose a hazard to many ecosystem characteristics (Keane, 2002)." (PF-FIRE-001, page 38)

The declaration "… many of the areas proposed for treatment exceed their historic ranges for fuel loadings …" is based upon controversial and unverifiable assumptions regarding historic conditions. The state of "historic conditions" is a hypothesis which is being continually researched. Historic conditions are guesses, not facts.

What may be verifiable is "Most of the tonnage is in the form of large woody material greater than 3 inches in diameter." However, if that is the case, then I submit that such material is not a fire hazard as claimed by the FS.

I have walked thousands of miles in the BNF and repeatedly documented areas of the forest that have experienced both recent and older wildfires. Most debris over 3" does not burn even during the most intense, fast-moving wildfire, scorch yes, burn no.

The FS continues to assert that accumulations of woody debris intensify wildfire without providing justification from recent scientific research. (Sullivan, 2018)

The Fuels/Fire Specialist Report addresses the impact of insects on fuels.

> "Past and current insect mortality is also contributing to some of the fuel loading." (PF-FIRE-001, page 38)

> "Falling snags and jack-straw logs are serious hazards for firefighters. Suppression forces should expect increased difficulties in fireline construction, increased difficulties in establishment of access and egress, and trouble in establishing and using escape routes and safety zones. In addition, fire line production rates drop when more logs need cutting (Page 2013). This has the potential to reduce the success of initial attack and require additional suppression resources (crews or equipment). The widespread snag hazards also pose a serious safety risk to firefighters. Fires in these forests may grow exceptionally large due to an unwillingness to put firefighters at risk." (Matonis, 2018).

> "It is important to emphasize that these conditions are significant and not short-lived and that MPB-affected forests might exhibit some degree of altered fire behavior for up to a decade or more after a MPB outbreak. Creating forest structures that are more resilient to wildfire at the stand and landscape levels may decrease the concerns and costs associated with fire suppression activities and the susceptibility of forests to MPB outbreaks (Jenkins, 2013)." (PF-FIRE-001, page 39)

Although the Agency "… does not contend that wildfires are likely to burn more severely because of insect outbreaks" (Draft DN Appendix B, page 34), the FS acts as if it does just that by "suggesting" that "Past and current insect mortality is also contributing to some of the fuel loading" (PF-FIRE-001, page 38) declaring "It is important to emphasize that these conditions are significant and not short-lived… ." (PF-FIRE-001, page 39)

The FS states its concern for the safety of firefighters:

> "Spot fires severely limit the ability of firefighters to contain a fire.
>
> "Fires exhibiting long-range spotting pose some of the greatest threats to firefighter safety because they are extremely difficult to control and are less predictable.
>
> "Surface fires were the more typical fire type in the lower-elevation, dry forests of the analysis area, and therefore, preferred to torching and crowning fires for both ecological benefits and fire suppression." (PF-FIRE-001, pages 39, 40)

That apparent concern for firefighters is justified; however, the Agency also makes the claim that wildfire should be allowed to run its course. The obvious answer to firefighter safety is to not send them to extinguish wildfires. Although the FS often states that wildfire is part of a healthy forest and that wildfires should be allowed to burn, it acts as if saving trees (for the timber industry) is the most important goal.

Suggested Remedies: Discontinue attempts to "restore" forests to some mystical "historical conditions."

Using the latest research for justification, establish realistic parameters for fire frequency and intensity in the BNF.

End attempts to save private property by thinning and logging public lands.

Cease declaring that catastrophic wildfire can be reduced by logging and thinning the WUI.

To increase firefighter safety, don't send them to extinguish wildfires outside the Community Protection Zone.

Allow most wildfires to run their natural course.

My Comment: The Draft EA contains insufficient analysis of project effects on animal species, including cutthroat trout, grizzly bear, black bear, multiple migratory bird species, cavity-nesting birds (snag habitat), bats, raptors, wolverine and other small mammals, etc. Also missing is an inventory of key wildlife habitat, a violation of NEPA. (DEA Comments, page 7)

Forest Service Response: The wildlife section of the draft EA, the Wildlife Effects Analysis Report (PF-WILD-001), and the Biological Assessment for Canada Lynx (PF-WILD-017 through PF-WILD-023) evaluated the environmental consequences of the proposed action on wildlife species and their habitats. Those species that were not selected for detailed analysis were displayed in Table 1 of PF-WILD-024 with rationale.

While Montana Fish, Wildlife, and Parks has recently closed hunting to moose in HD 250, moose are currently not a R1 sensitive species and are currently state ranked as S4: "Apparently secure, though it may be quite rare in parts of its range, and/or suspected to be declining." Osprey are also not considered an R1 sensitive species and are currently state ranked as S5-species: "Species is relatively common within suitable habitat and widely distributed across portions of the state." Buffer areas around Riparian Habitat Conservation Areas (RHCAs – see PF-AQUATICS-001) would minimize or eliminate impacts to these areas used by moose, osprey, and other riparian area-dependent species.

The Forest Vegetation/Silviculture Report (PF-SILV-001, p. 7) determined that 84 acres (0.2%) of the project area consists of shrub habitat from existing data sources. The Rare Plants specialist report (PFPLANTS-001) identified and analyzed rare and declining habitats associated with the project area.

The draft EA identified one of the needs of the project is to improve habitat and forage quality and quantity for wildlife species (draft EA, p. 3) and effects from climate change are addressed in the Wildlife Effects Analysis Report (PF-WILD-001) and the Biological Assessment for Canada Lynx (PF-WILD-017). While the Wildlife Effects Analysis Report discusses and analyzes effects of the proposed action on certain species, National Forest Management Act regulations require that "fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area" (36 C.F.R. §219.19). Management Indicator Species (MIS) is a concept adopted by the agency (1982 rule provision 219.19) to serve, in part, as a barometer for species viability at the Forest level. The role of MIS in meeting viability mandates compliments that of several other approaches, particularly management of sensitive species. In addition, the Forest Plan must establish objectives that maintain and improve habitat for MIS, to the degree consistent with overall multiple use objectives of the alternative (1982 rule provision 219.19 (a)). To meet this goal, planning for the fish and wildlife resources must meet several requirements including estimating the effects of planning alternatives on fish and wildlife populations and selecting certain vertebrate and/or invertebrate species as MIS. These species are selected because their population changes are believed to indicate the effects of management (1982 rule provision 219.19 (a)(1)). Within this context, both sensitive species and MIS are evaluated as a surrogate measure of treatment effects and expected outcomes to wildlife species as a whole in the project area.

Surveys have been conducted for wolverine, pine martin, and lynx as part of the Forest's winter carnivore monitoring effort for the past 6 years. Information regarding surveys and detections can be found in the related sections in the Wildlife Effects Analysis Report (PF-WILD-001). Grizzly bears are currently not classified as "may be present" in project area, and no grizzly bear occurrences or sightings have been recorded in the project area. Goshawks are not a Management Indictor Species for the Bitterroot National Forest, nor are they currently a

Regional Forester Sensitive Species; thus, site specific surveys are not required. However, if goshawk nests are identified during field surveys or project planning, nest trees will be protected with "Wildlife Tree" signage.

Assessment and analysis on the quality of habitat for different species of wildlife with respect to roads being removed from the project area would be highly speculative. A comprehensive travel analysis process was completed to review the transportation management components of the project (PF-ROAD-004). As required, all specialists, including wildlife, participated in the process to analyze the impacts to resources on the Forest. (Draft DN Appendix B, pages 36, 37)

Commentary: Squires et al. (Squires, 2012) noted that long-term population recovery of lynx and other species like grizzly bear, require short and long-distance connectivity. Lynx linkage zones for landscape connectivity should be maintained for movement and dispersal. Lynx avoid forest small-scales openings. Documentation of analysis of project-created, cumulative small-scale openings were not provided for the effects on connectivity. Connectivity between project area LAUs and adjacent LAUs was not analyzed or disclosed.

The proposed project's 20-year duration is a violation of NEPA because changes can and will occur in the project area. Grizzly bears are one example. The project area is a vital linkage zone for the Bitterroot Recovery area from the GYE. Even though grizzly bears may not be using the project area now, it is highly probable they will be in the next five years.

The DEA states there are no grizzlies in the area but also claims contractors and personnel will be instructed to report any encounters (DEA Appendix B, page 37). This implies FS expect to see bears in the area during the project. There have been five verified grizzly bear sightings only about 10 miles east of the Mud Creek Project (since 2005) and two possible sightings since 2011. It is possible, even likely, grizzly bears may be present in the Mud Creek landscape.

Logging whitebark pine, besides directly killing a species proposed for listing under the Endangered Species Act (ESA), is an adverse impact on grizzly bears. That impact should have been identified and included in a biological assessment and biological opinion.

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 FEA.

There is no analysis in the Mud Creek FEA related to motorized road and trail use and the impact grizzly bears.

Suggested Remedy: The FS hired a group of experts, headed by Martin Nie, to research who had the ultimate responsibility for managing and protecting wildlife—the states or the federal government—on federally managed lands. Through research of U.S. legal documents and case law, the group established that federal agencies have the ultimate responsibility for managing and protecting wildlife. (Nie, 2017)

It is obvious from Agency response to comments, the FS and the US Fish and Wildlife Service continue to deny their responsibility and duty to not only manage wildlife habitat but to manage and protect the wildlife. Rather than acknowledge that responsibility, those Agencies continues to pretend it is the states that are responsible for wildlife.

Federal agencies, including the FS must acknowledge responsibility and act accordingly. This project should be placed on hold until that happens.

My Comment: 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.[9] (DEA Comments, page 9)

Forest Service Response: The wildlife section of the draft EA and the Wildlife Effects Analysis Report (PF-WILD-001) evaluated the environmental consequences of the proposed action on wildlife species and their habitats, including cumulative effects. All the wildlife species analyzed in the project area are not endemic to the project area, the West Fork Ranger District, or the Bitterroot National Forest.

The Wildlife Effects Analysis Report (PF-WILD-001, pp. 5-7) documented the scope of analysis and the analysis methodology, and discloses the assumptions made during effects analysis. Information sources and statements regarding incomplete or unavailable information contain reference to "professional judgement." The imprecise nature of modeled data and limits of available scientific data are also addressed. For species requiring further information due to a lack of available data or questionable model outputs, the Design Features (draft EA, Appendix A) and Implementation Process (draft EA, Appendix B) serve as additional constraints on project implementation, as well as required during and postimplementation monitoring. The Design Features contain constraints on management activities based on the proposed activity. The Implementation Process requires all areas proposed for treatment to have wildlife surveys completed before any action is implemented (draft EA, Appendix B, pp. 24-25).

Cumulative effects and population viability are addressed for each species analyzed, including the appropriate applicable scale to each species. Some species cumulative effects were addressed at the project-area level, while other wider-ranging species were addressed at larger scales. One commenter references Schultz (2010, 2012), which discuss issues pertinent to the scale of cumulative effects analysis for wildlife and the limited availability of scientific information and monitoring data to inform analysis of the specific effects of past human activity on animal populations in the project area. The cumulative effects analysis takes into account effects of past, future, and ongoing activities using the best available scientific information. (Draft DN Appendix B, pages 38, 39)

Commentary: The above response indicates the FS assumed I am only concerned about how the project management activities will cumulatively effect wildlife. That is not true.

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[9] 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

Cumulative effects of the proposed management activities will affect far more than local wildlife species. Also effected will be an uncountable number of complex, interconnected ecosystems, the disruption of which will ultimately have an effect on humans.

So far, the Agency has done little more than pay lip service to the cumulative effects of management actions associated with projects. That must change.

Suggested Remedy: The FS must withdraw this project until a thorough, science-based analysis of the cumulative effect of management actions related to this and all other past, present, and anticipated future projects is completed.

The analysis must include management actions of all other local, state, and federal agencies. Granted, that is a large task, but much of the research has been completed by scientists who's published results are readily available.

My Comment: 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 or identifies a minimum road system in the project area. (Healey, 2020) (Talty, 2020). (DEA Comment, page 8)

Forest Service Response: None was discernable in Draft DN Appendix B.

Commentary: My DEA comment is important. Unless the project provides funding for road maintenance and BMPs, given the Agency's dismal road-maintenance record, the chance that those activities will come to fruition is doubtful.

Suggested Remedy: Before this project proceeds, solid funding for road maintenance and the installation and upkeep of BMPs must be provided.

My Comment: The minimum number of Old Growth trees under Green et al. (Green, 1992) 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." (Montana Field Guide, n.d.). (DEA Comments, page 9)

Forest Service Response: The wildlife section of the draft EA summarized the Wildlife Effects Analysis Report (PF-WILD-001, pp. 13-17; PF-WILD-025, p. 3) which evaluated the environmental consequences of the proposed action on flammulated owls and included literature that discussed habitat needs for population viability.

Commenters cited conclusions from Linkhart and Reynolds (1997) regarding percentage of old growth for consistently occupied breeding territories, and that the Forest Plan and the project-specific old growth amendment requirements for old growth trees per acre do not meet minimums for flammulated owl habitat. Linkhart and Reynolds (1997), in their study area, note

that there were a mean of 1.3 snags and live trees with cavities per hectare [2.5 acres] from previous site studies, and discuss percentage of old ponderosa pine (200-400 years old) as an important factor in breeding habitat for flammulated owls; however, this literature and other peer-reviewed flammulated owl research reviewed do not tie flammulated owls to "old growth" or a certain number of "trees per acre" but rather to mature and overmature stands that tend to contain large snags to provide nesting habitat.

The Implementation Process (draft EA, Appendix B, pp. 24-25) requires flammulated owl surveys for all areas of potential flammulated owl habitat (PF-WILD-025, p. 3) before project implementation can begin.

Design Features (draft EA, Appendix A, pgs. 53-55) inadvertently excluded protecting flammulated owl nest trees. Design Features have been included in the Final EA (Appendix A) to include flammulated owl nest protection buffers of 200 feet around any identified nest trees, and the updated Wildlife Effects Analysis report incorporated discussion and analyses based on the literature recommended (Linkhart, 1997). (Draft DN Appendix B, pages 40, 41)

Commentary: The Agency response to comments regarding Flammulated owls suggested that Linkhart and Reynolds (1997) "did not tie flammulated owls to 'old growth' or a certain number of 'trees per acre' but rather to mature and overmature stands … ," completely missing the point that trees in old growth areas consists mostly of are "mature and overmature (as FS silviculturists like to call them)."

Suggested Response: The FS must provide more exact, in-depth information about the management activities it has planned for old-growth stands so the public can understand the impact those treatments will have on flammulated owls and other wildlife species.

My Comment: The Draft EA for this project does not include adequate data about the history of soil compaction in the area caused by previous projects, road building, terracing, etc. In addition, there is insufficient information about the soil compaction that will be caused by the activities proposed for this project. The impact to soils from previous projects (in the area of this project), gathered from on-the-ground monitoring, should be released to the public before a Record of Decision (ROD) is signed. (DEA Comments, page 8)

Forest Service Response: Existing detrimental soil disturbance (DSD) estimates based on field surveys completed for this project include the impact of previous project impacts and the legacy effects of harvests, temporary roads, and terracing (PF-SOILS-001, p. 9) and found existing soil disturbance which includes the impacts of compaction to range between 0-16%. Existing DSD estimates will be completed in proposed treatment units as the treatment units are identified during the Implementation Process (environmental assessment, appendix B). As part of the Implementation Process, soil assessments will be made for each proposed treatment unit where past harvest has occurred, where other risk factors are present as described in the Soils Specialist Report (PF-SOILS-001) and the Soil Risk Framework (PF-SOILS-008), and where identified spatially for the Mud Creek project area (PF-SOILS-010).

The Soils Specialist Report describes the terraces with a few exceptions as detrimentally disturbed (PFSOILS-001). Because of the legacy impact to soils in the terraced areas, any units with commercial thinning and commercial harvest proposed on the terraced areas will be surveyed during the Implementation phase to assess existing soil disturbance and ensure that following treatment cumulative soil disturbance will remain at or below the 15% DSD.

The Soil Risk Framework (PF-SOILS-008) is a way to assess where proposed actions like timber harvest and prescribed fire will have the greatest impacts and help prioritize locations for field assessments. Soil scientists completed field surveys as a part of the project development to assess initial soil disturbance (PF-SOILS-001) and found that existing disturbance was variable between 0-15%. The areas in the Lower Soil Risk Categories (PF-SOILS-001) as described in the framework document (PF-SOILS-008) had little to no existing soil disturbance. For units proposed in these project areas, only a subsample of units will be surveyed as a part of the implementation process of the Mud Creek Project (PF-SOIL-001; environmental assessment, appendix B) unless issues are flagged during layout by other specialists. All of the commercial harvest units that are proposed in the implementation phase that fall within moderate and higher risk categories for soil risk will be assessed in the field by the soil specialists following the Region 1 Soil Disturbance protocols (SOILS-003).

The project record includes the draft Bitterroot National Forest 2019 Biennial Monitoring and Evaluation Report (PF-SOILS-006). The soils section includes a summary of long-term soil monitoring on the Bitterroot National Forest and a figure of how detrimental soils disturbance has changed over time in response to different timber harvest methods between 1990 and 2017. The report shows a decrease in average post-harvest soil disturbance regardless of prescription. (Draft DN Appendix B, page 57)

Commentary: The draft Bitterroot National Forest 2019 Biennial Monitoring and Evaluation Report does not appear to be (PF-SOILS-006) as claimed. That file, despite its name and being available from the FS website, is the Forest Plan Monitoring and Evaluation Report, Fiscal Year 2002.

Suggested Remedy: Please supply the draft Bitterroot National Forest 2019 Biennial Monitoring and Evaluation Report and specify the page(s) on which soil disturbance changes appear.

My Comment: 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, etc.). The Draft EA's proposed methods for dealing with the project's certain spread of weeds is unsatisfactory. Comparing the aftereffects of similar treatments during other BNF projects verifies this claim. (DEA Comments, page 8)

Forest Service Response: Design features are in place that will prevent the introduction of new weed species and help prevent the spread of existing species in the area. Design features are included to address timber harvest, skid trails, road work, pile burning, and other project activities that may cause spread of invasive or noxious plants. The herbicide design feature allows for treatment of small infestations of new invader species, as well as pre- and post-haul

treatment of roads, temporary roads, and skid trails. Recurring weed treatments are effective in preventing further spread of weed infestations. When treatment occurs on early infestations they can frequently be eradicated. When requirements such as using weed seed free gravel, reseeding disturbed sites, cleaning all equipment before entry to the site are followed, new roads are no more a source of noxious weed infestations than existing roads.

Site-specific inventory for noxious weeds will happen during the implementation process when project sites are planned. Currently inventoried noxious weed species located in the project area are listed in the specialist report with their general location. There are a number of formal monitoring sites across the Forest. Each set is completed at least every 5 years and on a rotating bases so that some monitoring is completed every year. Elkhorn rush skeletonweed treatments in the Frank Church River of No Return Wilderness were read in 2020. The cause of these infestations is not known, but there are many vectors that can carry and spread weeds including wind, birds, wildlife, rodents, wildfires, stream flows, and many human caused modes such as riding and pack stock, vehicles, OHV's, snowmobiles, firefighting and logging equipment, trail bikes, mountain bikes and other machinery, hikers, and other recreationists. Monitoring shows increases of all existing plant species as ground disturbing activities expose existing seed. Plants such as common mullein, a naturalized non-native but not a state listed noxious weed, is the most common. Cheatgrass, also not a state listed noxious weed in Montana, but a Priority 3 regulated plant not allowed to be sold, is also commonly found on the increase, as well as spotted knapweed.

Road decommission, like all ground disturbing actions proposed in the project have the potential to create vectors of disturbance for invasive plants. As described in the Aquatics Specialist Report, PFAQUATICS-007, herbicide application will be completed in disturbed areas. Ideally, pre-treatment and post-treatment will control infestations of invasive plants while native revegetation recovers. Lighter treatments for road decommissioning may be used in some areas; however, extensive research shows that lighter treatments fail to reduce the compaction and restore hydrologic processes and, consequently, have increased rates of sedimentation compared to recontouring treatments (Luce, 1997); (Madej, 2001); (Foltz, 2007); (Eastaugh, 2008); (Lloyd, 2013).

Biocontrols that are approved for release have been released in many places across the forest and continue to be released as new locations of weed species are identified. Some species such as Cyphocleonus for spotted knapweed take many years to establish and are only found in mature plants. (Draft DN Appendix B, pages 59, 60)

Commentary: Design features prevent the spread of weeds, IF they work. This proposed project includes the same design features as recent past projects. Unfortunately, the past is an indication of what to expect from management activities included in the Mud Creek project. There is not a single BNF project in recent memory that has not introduced infestations of weeds to new areas. Whether that can be attributed to poor design features or poor implementation is a matter of conjecture. However, the result is weeds being introduced or spread to new areas of the Bitterroot Forest.

Suggested Remedy: The FS must discover whether design features need to be changed, more oversight is required to ensure proper implementation, or a combination of both. Whatever

the problem, the Agency should halt this and all other BNF projects until an effective, workable solution can be applied in the field.

My Comment: The EA evaluation of prescribed fire and logging on whitebark pine within the project area is inadequate and does not provide satisfactory analysis of existing research. (DEA Comments, page 7)

Forest Service Response: The rare plant specialist report speaks on whitebark pine and the proposed activities. Whitebark Pine was listed as a candidate species in 2012. As of December 2, 2020, the U.S. Fish and Wildlife Service has proposed to list the whitebark pine as a threatened species under the Endangered Species Act. A biological assessment relative to impacts to whitebark pine from this project will be prepared and any necessary concurrence from the USFWS will be obtained prior to a decision being signed for this project.

The biological assessment for whitebark pine will disclose in greater detail the effects on the species from the proposed treatments in the project. Cone bearing trees will be protected from any activities proposed.

The project area was partially surveyed for whitebark pine in 2019 and 2020. More encompassing surveys will be conducted once units are created within whitebark pine habitat.

Currently there are established roads near or within whitebark pine habitat. If roads were removed and decommissioned, whitebark pine would slowly move into those areas that were roads if they are within whitebark pine habitat. (Draft DN Appendix, page 60)

Commentary: It is not enough to declare "Cone bearing trees will be protected from any activities proposed." Whitebark pine that are not currently producing cones are likely to do so in the future. Removing non-cone-bearing trees ensures that future cone production will be diminished.

Research by Hart, S.J. et al. (2015) revealed that widespread and severe insect infestation restrict subsequent invasions. (Hart S. J., Negative feedbacks on bark beetle outbreaks: widespread and severe spruce beetle infestation restricts subsequent infestation, 2015). This conclusion conflicts with current FS claims.

Later research by Six, D.L. et al (2018) suggests that Hart's finding of infestations restricting subsequent invasions are possibly the result of beetle choice and may result in a strong selection of trees for greater resistance to attack. (Six, Are Survivors Different? Genetic-Based Selection of Trees by Mountain Pine Beetle During a Climate Change-Driven Outbreak in a High-Elevation Pine Forest, 2018)

The most recent research by Six, D.L. et al (2021) strongly suggests that, thinning—the standard FS prescription for insects—has for whitebark pine, "little-to-no effect on enhancing constitutive defense against the insect" and that "… results also indicate that thinning prescriptions aimed at increasing tree growth in whitebark pine should be applied with considerable caution." (Six, Growth, Chemistry, and Genetic Profiles of Whitebark Pine Forests Affected by Climate-Driven Mountain Pine Beetle Outbreaks, 2021)

Suggested Remedy: This project should include no management activities that directly or indirectly affect whitebark pine.

My Comment: No management activities should be implemented in Wilderness Study Areas (WSA) or Inventoried Roadless Areas (IRA). (DEA Comments, page 7)

Forest Service Response: Please refer to roadless analysis (PF-REC-001; pp. 6-12) for an analysis of each area in the roadless expanse. The analysis used an assessment of roadless characteristics as units of measure (p. 5) for compliance with the Roadless Rule and 1964 Wilderness Act. The proposed action specifically states that there will be no road construction in wilderness study areas or inventoried roadless areas (draft EA, pp. 41, 42). The Forest Plan allows for vegetation treatment in inventoried roadless areas "to meet the goals and recreation standards of this management area." Vegetation treatment is not being proposed in wilderness study areas for this project. The effects of prescribed fire have been analyzed and can be found in the roadless report. Design features have been developed and will be implemented to ensure compliance with the forest plan and maintain wilderness and roadless characteristics. (Draft DN Appendix B, page 62)

Commentary: WSAs and IRAs provide critical habitat for many animal species. Performing management activities to “improve” the forest are likely to damage that habitat.

Suggested Remedy: No management activities should be implemented in WSAs or IRAs.

My Comment: 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. (DEA Comments, page 9)

Forest Service Response: The Project Economic Analysis Tool (PEAT) incorporates project preparation costs and the costs associated with reclamation and future maintenance. Post-project monitoring costs are not included in the economic analysis because analysis of these costs is not required by the Forest Plan (USDA Forest Service 1987, p. II-23). (Draft DN Appendix B, page 64)

Commentary: Using Forest Plan requirements as an excuse not to analyze post-project monitoring costs is a poor explanation. Such monitoring is absolutely necessary to learn if management activities accomplish what is promised and to discover and eliminate mistakes and errors in planning. If costs associated with post-project monitoring are not included and funding not ensured, the likelihood that post-monitoring will happen is greatly diminished. Without post-project monitoring, nothing is learned and mistakes are perpetuated rather than corrected.

Suggested Remedy: Post-project monitoring must be included as part of this project and proper funding ensured.

My Comment: 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. The promise is therefore meaningless. (DEA Comments, page 7)

Forest Service Response: The Forest Service will request budgets that will provide the needed funding to implement the Mud Creek project. Appropriated program dollars and timber sale receipts will fund most or all of the project's noncommercial activities. Monitoring also will be funded through appropriated funds. The Forest Service will continue to be open to opportunities for partnerships or grants to enhance capacity for monitoring.

Funding for road work and best management practices improvement can be done a variety of ways. Appropriated dollars and public works contracts maybe used outside of a timber sale road package to implement best management practices. Timber sale road packages are used to implement best management practices on existing roads, and best management practices are considered along with Forest Plan direction in the design and construction of new specified roads. The Bitterroot National Forest has a road crew and a regular maintenance program. Work for the crew is identified by forest specialists and forest priorities. Road maintenance plans and accomplishments are reported on an annual basis. Road work may be directed related to priority funding sources and some areas of the forest may receive more attention than others while those funds are available. Roads adjacent to streams often get more treatments than those that traverse large areas of land crossing drainages. Drain dip and road drainage features are treatments that will remain on the landscape long after treatment activities are complete. It is not uncommon to have aquatic organism passage sites cleared for improvement in a project decision, designed with special funding, and constructed years later. Installations and contract packages are subject to funding sources and forest priorities.

Trails are managed over a 5-year rotation. Some get maintained annually, others have get maintained every 2, 3, 4, or 5 years as priorities and budget allow. The Forest Service has partners who also play a role in keeping trails maintained. (Draft DN Appendix B, page 65)

Commentary: There is a long history of post-project beneficial work left uncompleted in the BNF. Expecting the public to believe funds will be “requested” or available from “timber sale receipts” is without merit; the history of promised post-project work not performed is too long and well known.

Expecting “opportunities for partnerships or grants to enhance capacity” to cover necessary post-project work is magical thinking and an attempt to shift the responsibility for such functions from the Agency to the public.

Suggested Remedy: The FS must include the cost of beneficial, post-project operations in the project proposals; otherwise, the work is unlikely to be completed in a timely fashion.

My Comment: The large size of this project (over 45,000 acres), the high levels of existing soil disturbance from past projects (terracing), the exceptionally high road densities, and the presence of ESA-listed species (bull trout, lynx), suggests that an EIS analysis is required. (DEA Comments, page 6)

Forest Service Response: The responsible official has found that the environmental assessment is sufficient and that an environmental impact statement is not needed because the project will not have a significant effect on the quality of the human environment. The draft finding of no significant impact explains the rationale for the responsible official's finding based on the definition of significance in the Council on Environmental Quality National Environmental Policy Act regulations that were in place at the time of project initiation (43 FR 55990). The finding is based on the effects analysis contained in the environmental assessment and documentation in the project record. The resource-specific specialist reports in the project file recommend conclusions to support the responsible official's finding of no significant impact. (Draft DN Appendix B, page 67)

Commentary: Proclaiming "an environmental impact statement is not needed because the project will not have a significant effect on the quality of the human environment" is an insufficient reason. It may be "legal" but, during a time when global warming is accelerating, even "the smallest impact on the quality of the human environment is significant." The Agency is not claiming this proposed project will have "no impact" on the human environment; thus, implying there is "some impact." Therefore, the question is, "What is significant?"

This project will indirectly affect the human environment by directly affecting natural ecosystems. The FS repeatedly affirms such impacts are too small and unmeasurable, while resisting meaningful analysis of cumulative effects which can be measured.

Suggested Remedy: The Agency must concede this project's management actions impact the human environment, however insignificantly, and then perform and publish a science-based analysis of the cumulative effects of this and all other past, present, and anticipated future project on the BNF.

My Comment: This project's **Purpose** violates legal precedence and rules out all other alternatives for achieving the goal of "improving resilience" without providing justification. Additional alternatives to the proposed action should be specified. (DEA Comments, page 2)

Forest Service Response: The interdisciplinary team developed the proposed action to meet the purpose and need of the project and address the issues. The environmental assessment contains analysis of the effects of the proposed action and no action alternatives, and the draft decision notice describes the responsible official's consideration of the alternatives. During the scoping and draft environmental assessment comment periods, commenters provided several management suggestions that could be considered as elements of a full alternative. The interdisciplinary team integrated these suggestions into the proposed action, analyzed them as part of the no action alternative, or provided rationale not analyzing them in detail. Chapter 2 of the environmental assessment describes each of the alternatives considered but not analyzed in detail. In general, the alternatives not analyzed in detail do not meet the purpose and need for the project. The Forest Service has the discretion to determine the purpose and need for the project, which influences the scope of the analysis, including the range of reasonable alternatives (FSH 1909.15, chapter 10, section 11.21). (Draft DN Appendix B, page 67)

Commentary: The fact that the FEA provides only two alternatives, "do nothing" or "do what is proposed," is problematic and probably illegal. In 1997, the 7th Circuit Court held that "a federal agency failed to examine the full range of reasonable alternatives…" (Simmons v. US Army Corps of Engineers – 1997, No. 97-1131). Other than the two offered, there are other obvious alternatives. The project should include those or run afoul of NEPA directives.

Suggested Remedy: The Agency must pull the FEA and provide additional alternatives for this project.

My Comment: Because the Draft EA includes information not included in the scoping documents and because much of the project area remains inaccessible (as of mid-April), the comment period should be extended to at least July 1st when the area will be more accessible. Another reason the comment period should be extended is that 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 predetermined PN. That volume of information, which certainly required the FS more than 30 days to generate, necessitates more than a 30-day period for thorough study. (DEA Comments, page 6)

Forest Service Comments: The regulations at 36 CFR 218.25(a)(iv) prohibit extension of the comment period for a draft environmental assessment. (Draft DN Appendix B, page 68)

Commentary: The length of a comment period, 30 days v. 45 days, is one of the many reasons this project should have been conducted using an EIS v. EA. A reasonable person could conclude that, besides attempting to implement this project using a condition-based format which already limits public input, the Agency purposely decided upon using an EA to further limit public input.

Suggested Remedy: This proposed project must be withdrawn and reissued using an EIS without a condition-based format.

My Comment: 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. Consequently, 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." (DEA Comments, page 7)

Forest Service Response: All analyses for the project used the best available scientific information. The specialist reports in the project file and the environmental assessment each contain lists of citations to information used to conduct the effects analyses. The interdisciplinary team considered all references submitted by commenters during the scoping and draft environmental assessment comment periods. If literature submitted by commenters had not already been included in project documents, the interdisciplinary team incorporated that literature or determined that it did not constitute the best available scientific information.

The site-specific plan amendments are subject to the requirement in the 2012 Planning Rule to sue the best available scientific information to inform the planning process (36 CFR 219.3). The decision notice for this project documents how the best available scientific information was used to inform the amendments. Appendix D describes the amendments' use of the best available scientific information in detail. In general, the amendments are intended to apply the best available scientific information about the ecological conditions required by elk and historic characteristics of coarse woody debris and old growth in the project area. (Draft DN Appendix B, page 71)

Commentary: The first paragraph of the FS response proclaims, "the project used the best available scientific information." The response then claims the interdisciplinary team (IDT) "considered all references submitted by commenters during the scoping and draft environmental assessment comment periods" and "incorporated that literature or determined that it did not constitute the best available scientific information."

Proclaiming the Agency uses "the best available scientific information," implies all other scientific information is inferior. "Considered" is not equivalent to "analyzed" and could be interpreted as nothing more than "a cursory glance." "Incorporating literature" into a reference list is not equal to careful analysis. To have the IDT, a group which decided it "already used the best available scientific information," conclude information supplied by others and the team discounted, "did not constitute the best available scientific information" is unsurprising, problematic, and unacceptable.

Suggested Remedy: The IDT must acknowledge the equal importance of the newest scientific research that, in many cases, contradicts the long-held assumptions and traditions of the FS.

The Agency must withdraw this project until the IDT completes an in-depth, fair analysis of contradictory science and provides a comparison with traditional assumptions for public review.

Respectfully,

M L Hoyt

Michael Hoyt

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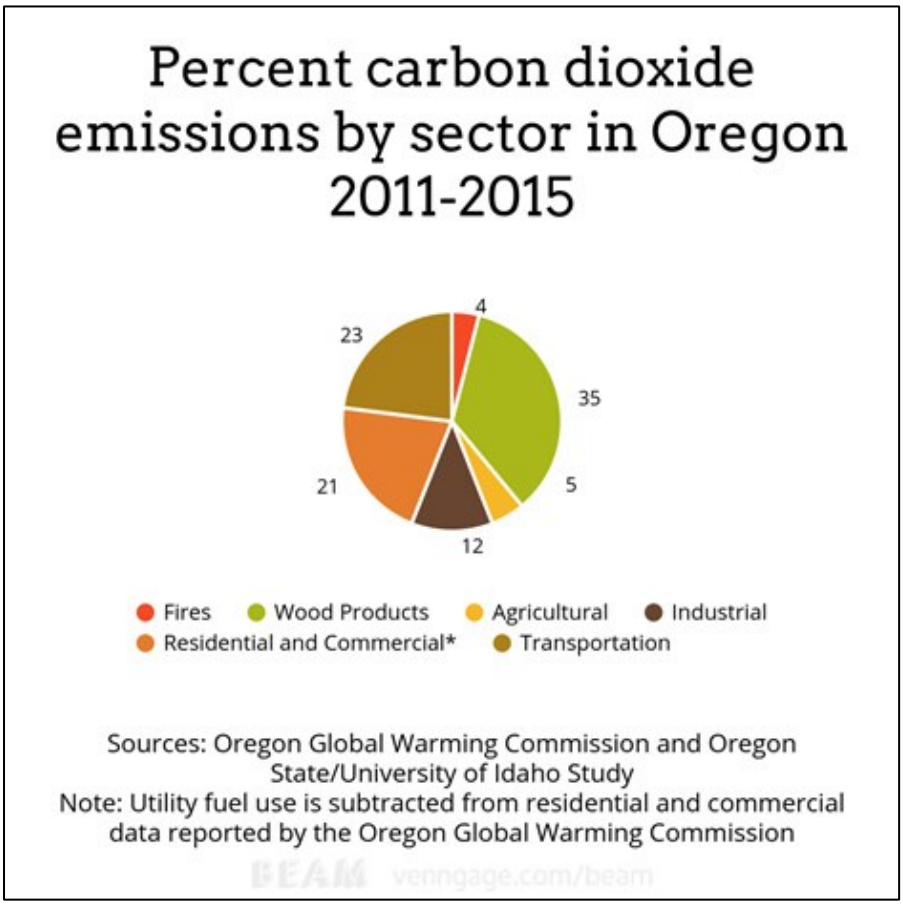
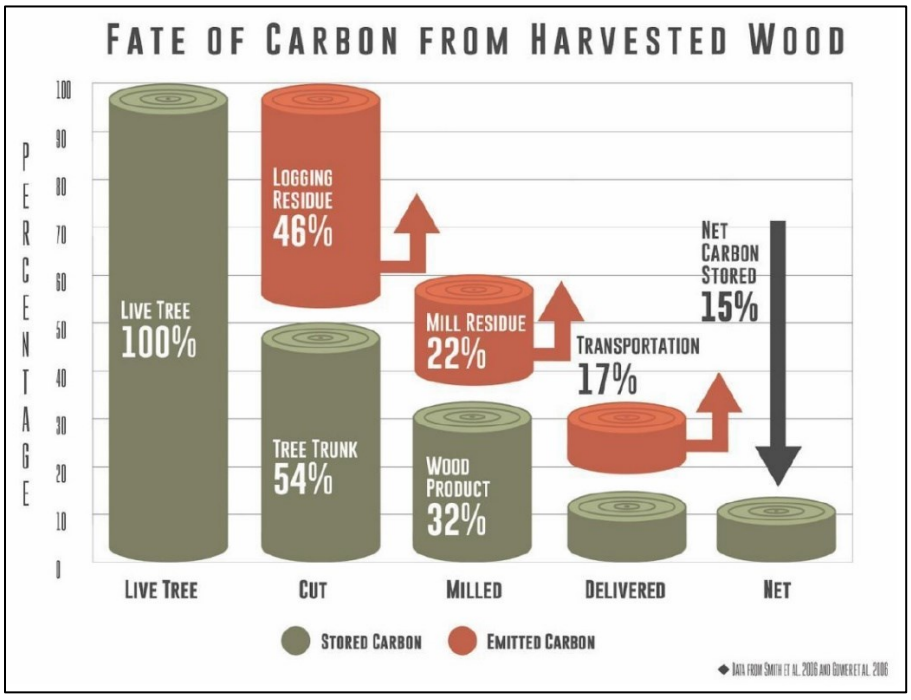
Appendix A


Percent carbon dioxide emissions by sector in Oregon 2011-2015
4
35
5
12
21
23
Fires
Wood Products
Agricultural
Industrial
Residential and Commercial*
Transportation
Sources: Oregon Global Warming Commission and Oregon State/University of Idaho Study
Note: Utility fuel use is subtracted from residential and commercial data reported by the Oregon Global Warming Commission
BEAM venngage.com/beam


FATE OF CARBON FROM HARVESTED WOOD
PERCENTAGE
100
90
80
70
60
50
40
30
20
10
0
LIVE TREE
100%
LOGGING RESIDUE
46%
TREE TRUNK
54%
MILL RESIDUE
22%
WOOD PRODUCT
32%
TRANSPORTATION
17%
NET CARBON STORED
15%
LIVE TREE
CUT
MILLED
DELIVERED
NET
STORED CARBON
EMITTED CARBON
DATA FROM SMITH ET AL. 2006 AND GOMEZ ET AL. 2006