August 9, 2021

Matt Anderson, Forest Supervisor/Responsible Official
Steve Brown, Stevensville District Ranger
Gold Butterfly Project
1801 N. First St.
Hamilton, MT 59840-3114

Commentors: Friends of the Bitterroot, WildEarth Guardians, Alliance for the Wild Rockies, Native Ecosystems Council and Gail H Goheen & Steven S Goheen.

RE: Comments Related to the Gold Butterfly Draft SEIS

Submitted online via https://cara.ecosystem-management.org/Public//CommentInput?Project=59262 and e-mailed to Steve Brown steve.brown2@usda.gov and Matt Anderson matthew.anderson3@usda.gov and hand delivered to Supervisor office, 1801 N 1st street, Hamilton, Montana.

Dear Supervisor Anderson and Ranger Steve Brown

These comments are submitted on behalf of Friends of the Bitterroot (FOB), WildEarth Guardians (Guardians), Alliance for the Wild Rockies (AWR), Native Ecosystems Council (NEC), and Gail H Goheen & Steven S Goheen. We also incorporate and sign onto comments submitted by AWR, NEC and FOB, and by Gail H Goheen & Steven S Goheen.

We appreciate the opportunity to comment on the Gold Butterfly Draft SEIS (DSEIS). We incorporate and attach our Gold Butterfly scoping comments, our DEIS Comments, our Gold Butterfly Objection, and our comments on the programmatic forest wide amendment for Elk Habitat Objectives. Our objection to the Gold Butterfly project still stands and these DSEIS comments are meant to supplement our objection and become part of the public record.

These comments address the Gold Butterfly DSEIS and its proposal for a site-specific Forest Plan amendment to Old Growth (OG) standards on the Gold Butterfly project as detailed in the DSEIS and new information since the ROD. The Gold Butterfly project, covering approximately 55,147 acres, will include 5,621 acres of commercial harvest including 2,081 acres in regeneration cuts, and 14 openings over 40 acres totaling 1,508 acres. We find the DSEIS inadequate and we oppose the proposed amendment to OG standards, based on the following reasons in **bold**. Requests for more information are underlined.

DSEIS does not include a modified alternative 3 as requested by a large portion of commenters. In FOB comments page 1, we asked for an SEIS that analyzed a modified alternative 3 which prohibits logging of any large, old trees. Setting a scientifically-based diameter limit such as 12" would allow areas not meeting old growth criteria to naturally develop old growth character as quickly as possible under natural processes. We also asked that the modified alternative include no new road building, including any utilization of the rediscovered "undetermined" roads. This alternative would be consistent with the Travel Management Regulations Subpart A

requiring that the agency consider in an environmental assessment or environmental impact statement a science-based Travel Analysis Process in order to identify the minimum road system. 36 C.F.R. 212.5(b). In addition to reducing the environmental consequences from a road system the Forest Service cannot afford to maintain, identifying the minimum road system would disclose and direct limited maintenance funding to those roads that pose risks to watershed function, wildlife habitat, and the overall ecological integrity of the planning area. The DSEIS does not address these requests. Please analyze a modified alternative that includes the above concerns.

A Site-Specific Amendment of Old Growth Standards is not appropriate given that the same amendment is requested for the BNF Mud Creek project and the proposed BNF Bitterroot Front project. Both are large projects, and together with Gold Butterfly cover a large percentage of BNF's area outside the Wilderness areas. Site-specific amendments are meant to address unique characteristics of a particular forest area, not to repeatedly address conditions that are common throughout an entire forest or region. The Forest Service is applying this amendment for all ongoing projects because it is no longer workable for the forest as a *whole*. The DSEIS, p. ii, states: "the Bitterroot has been using Green et al. criteria to inventory and monitor old growth since this best science became available," violating the 1987 Forest Plan for almost 30 years. A site specific amendment must still be in line with forest plan objectives and NEPA. As the forest plan is a contract with the public and the public values old growth as large trees (few public wander the forests with coring capabilities), the forest plan dbh criteria honors that contract. Throughout the process, the public has made clear their wish to preserve old growth. This DSEIS ignores the contract with the public and their comments concerning old growth. Clearly, the amendment must be proposed as a forest-wide Forest Plan amendment, not amended away one geographic area at a time. BNF must conduct the required forest-wide planning and NEPA public process to amend old growth standards. Please provide an assessment of the proposed amendment's significance in the context of the larger forest plan as required (36 C.F.R. § 219.10(f), FSH 1922.5). Please evaluate this proposed forest plan amendment as to whether it would constitute a significant change in the long-term goods, outputs, and services projected for an entire National Forest as required by The National Forest Management Act (NFMA). Please explain what unique characteristics occur in the Gold-Butterfly area that qualify it for a site-specific amendment when other identical amendments are proposed on two other large projects. Please provide analysis of cumulative effects of using this site- specific amendment together with the other similar site-specific amendments for the Mud Creek and Bitterroot Front projects.

BNF fails to demonstrate the necessity of amending the Forest Plan "to change Management Area direction related to minimum stand size to classify stands smaller than 40 acres as old growth to better align with Forest Service handbook direction and to protect smaller stands of old growth that are ecologically important" (DSEIS, p. 2). In reality, "*the Bitterroot has been using Green et al. criteria to inventory and monitor old growth since this best science became available*"(DSEIS, p. 2). If so, BNF has violated the Forest Plan for almost 30 years. It is not clear why the Forest Plan was not amended then, nearly 30 years ago, but now it is suddenly a necessity**.** There is currently nothing that prohibits BNF from protecting any and all old growth defined by any definition now, including the "*smaller stands of old growth that are ecologically important"* (DSEIS, p. 2). BNF does not need a Forest Plan amendment to protect any and all old growth by any definition if that's what it wants to do. It seems more likely that BNF needs this amendment to allow them to cut more old, large trees. In fact, DSEIS p. 12, appears to state exactly that: *"The proposed old growth amendment is responsive to the purpose of the project which is to improve landscape resilience to disturbances (such as insects, diseases, and fire)* ***by modifying forest structure and composition****, and fuels."* (emphasis added). And DSEIS, p. 2 states: "*It is important to note that the Gold Butterfly Project analyzes various treatments, including commercial harvest, within stands that qualify as old growth.*"

BNF complains that *"the Plan criteria do not specify any minimum age for the large trees used to determine whether a stand qualifies as old growth. Large trees used to determine the presence of old growth are defined only by size as quantified by diameter at breast height (dbh). This is problematic because several common local tree species (e.g. ponderosa pine, Douglas-fir, Engelmann spruce) growing on productive sites can exceed the Forest Plan criteria of 20" dbh size minimum when they are younger than ages typically associated with old growth*." (DSEIS, p. 11). Why would this be a problem if BNF's intention is to "*replace old growth standards with more ecologically sound direction which will provide for old growth habitats"* (DSEIS, p. 3). A 20" diameter limit would protect all old growth by either definition. For example, the Como Forest Health Project placed an upper dbh limit of 20" for treatment units that contained any old growth regardless of acreage. From the Como ROD (Attachment I) : "*We would reduce stand density in both units to between 60 and 80 BA and would not harvest trees 20 inches diameter at breast height (DBH) or larger. One of the old growth criteria in Green et al (2005) is a minimum of eight trees 21 inches or larger****. By retaining trees 20 inches or larger, we will retain all the trees that qualify as old growth and provide replacement trees as the older, larger trees age and die. We also meet the minimum stand density characteristic for old growth by maintaining stands above 60-80 BA (Green et al. 2005)"*** (emphasis added). The Como project appears to have been more forward-thinking than the Gold Butterfly project, or perhaps the politicians have since increased the timber mandate.

Green et al caution: *"Do not accept or reject a stand as old growth based on the numbers alone; use the numbers as a guide****."*** In other words, there is more to old growth than the trees; there is also understory, ground cover, wildlife cover, down woody debris, snags, soil organic matter, etc. Green et al provide no minimum criteria for any of these associated characteristics. The Forest Plan Old Growth standards do include minimum criteria for snags and down debris, and the Forest Plan states that in old growth, heart rot, broken tops, and lichens/mosses are common; stands are uneven aged or multistoried (p. II-19). In the recent Buckhorn project, BNF used Greene et al to disqualify stands as old growth based solely on age and numbers. This allowed those mature stands that might have qualified as old growth by FP standards to be harvested. Removing these mature stands from the forest misses an opportunity for recruitment and replacement of old growth at the detriment of wildlife dependent on mature forests. It seems the dbh measure in the Forest Plan ensures old growth in the future. "Unit 14 contains portions of two stands (4502062 and 4502063) that are identified as OG in the OG database. OG plots installed in the portions of these stands within the Unit 14 boundary on 11/14/2019 determined that 4502062 did not qualify as OG because the trees >20" DBH averaged about 114 years old, with a range from 76 years to 134 years. OG in this habitat type group is defined as more than 8 trees/acre that are over 21" DBH and are greater than 170 years old. **Harvesting in this stand will not reduce the existing OG percentage in this drainage/MA polygon because the trees are too young** to qualify as OG." (Buckhorn PF WILD-001 emphasis added) <u>Please explain how this amendment will allow for recruitment of future old growth to fulfill management area standards.</u>

While eliminating the Forest Plan's 40-acre old growth minimum will require the protection (protection is already allowed) of smaller old growth stands, small stands do not always have the same ecological value as larger ecologically connected stands. Green et al (p. 12) state:

"The third point to bear in mind when evaluating old growth is that a stand's landscape position may be as important, or more important than any stand old growth attribute. The landscape is dynamic. We need to do more than draw lines to manage this dynamic system. Consider the size of old growth blocks (large blocks have special importance), their juxtaposition and connectivity with other old growth stands, their topographic position, their shapes, their edge, and their stand structure compared to neighboring stands. Stands are elements in dynamic landscape. We need to have representatives of the full range of natural variation, and manage the landscape mosaic as a whole in order to maintain a healthy and diverse systems."

USDA Forest Service (1987) states: "*Isolated blocks of old growth which are less than 50 acres and surrounded by young stands contribute very little to the long-term maintenance of most old growth dependent species***."**

It appears that the Bitterroot Forest Plan (p. III-4) also recognized the importance of landscape position, directing BNF to: "*Provide 40-acre stands of old growth by coordinating management activities in this area with activities in adjacent management areas and with intermingled riparian and unsuitable management areas*."

Clearly, a bunch of isolated, small old growth stands do not equal a few large, well-connected old growth stands. And smaller old growth stands can be protected and moved towards OG status by drawing a line around them to 40 or more acres and providing a dbh limit to recruit old growth as was done in the Como project.

To help us evaluate the necessity of this Forest Plan amendment, please provide maps comparing old growth in the project area using both definitions (Forest Plan and Green et al standards). For the project area, please provide existing percentages for old growth habitat by management area and drainage using Forest Plan standards, just as you have done for Green et al standards in the DSEIS, p. 12. Demonstrate that use of the Green et al standards will indeed result in more old growth habitat preservation. Please provide comparisons of projected timber production from Gold Butterfly treatment units that contain old growth for each definition/standard. Please provide all old growth monitoring results for BNF since 1992 using either standard.

BNF fails to demonstrate the necessity of amending the Forest Plan "*to accurately measure the amount and type of old growth within the project area…. evaluate whether we are meeting Forest Plan goals…. and monitor whether we are moving away from or towards Forest Plan goals"* (D**SEIS, p. 18-19**). The DSEIS, p. 17, also states **"***Additionally, by adopting Green et al. we are able to monitor old growth because the Bitterroot National Forest has used the Northern Region monitoring approach.*" While the Forest Plan standards include more minimum criteria than Green et al, they are not particularly hard to measure-- dbh, trees per acre, tons of CWD debris, presence of heart rot/broken tops, presence of lichens and mosses, 40 acre minimum size, 75% canopy closure**.**

The DSEIS, p. 11, complains: "*Even if we understood what potential canopy closure was, canopy closure is difficult and laborious to measure on the ground and is subject to a high degree of subjectivity. It is not one of the measurements collected during common stand exams. Further, canopy closure is not measurable using remote-sensing tools*." An internet search reveals several ways to measure canopy closure (https://www.ecologycenter.us/forest-ecology/measuring-canopy-closure.html). Coring trees is also laborious and not measurable using remote-sensing tools, but amending standards to Green et al's will require coring. Concerning the use of remote sensing to identify old growth, it is worth noting that remote-sensing tools and walk-throughs failed to identify a 25-acre old growth stand on the Westside project, which was subsequently logged and taken out of old growth status as defined by Green et al, violating HFRA. Amending the old growth standards will not necessarily solve that problem; only ground-truthed stand exams are reliable.

While your attention to measurement, evaluation, and monitoring are commendable, on past projects we have seen little, if any, post-project monitoring and no use of those data to evaluate results and practice adaptive management. Please provide old growth monitoring data and results for the entire Bitterroot National Forest since 1992. Please disclose the methods used or planned for identification of old growth in the Gold Butterfly project (GIS data, remote-sensing, stand exams, walk-throughs, etc). Please analyze and disclose the natural historic range vs. current conditions regarding patch size, edge effect, and amount of interior forest old growth in the BNF as Green et al suggest. Considering the difficulties expressed, please explain how you were able to evaluate OG and comply with forest plan standards for old growth in the Piquett Creek project.

BNF failed to rigorously explore and objectively evaluate all reasonable alternatives as required by NEPA (40 CFR 1502.14). What could be more arbitrary and capricious than amending the plan to match standards that BNF has illegally been using for almost 30 years? Numerous deficiencies in Green et al have been pointed out by other scientists (Yanishevsky, 1994; Shultz 1992), including a lack of peer review, a lack of new field work to verify existing plot data, no estimates of the natural range of variation of old growth, and no criteria for the evaluation of old growth quality. Green et al include only two quantifiable measurements: trees per acre

meeting age and dbh criteria and basal area. If BNF wanted to more accurately assess old growth, they could have developed criteria that built on Green et al and analyzed that as an alternative. For example, in old growth Ponderosa/Doug Fir, they could have increased the trees per acre to Green et al's average of 15, specified Green et al's average of 6 snags per acre, included a minimum for CWD, specified a number of broken-topped/hollow trees per acre, etc. Such an alternative amendment would certainly be more scientifically sound than the only one offered in the DSEIS. Please develop a third alternative that considers ALL of Green et al's data and results and includes more quantifiable criteria than either Green et al or the Forest Plan. Please develop and analyze a fourth alternative that uses Greene et al to identify old growth but also retains the 40 acre size limit and a dbh limit to ensure recruitment of old growth and provide protection for mature stands that do not qualify as old growth for various reasons.

Green et al (1992 updated 2011) does not represent the best available science. Though Green et al was updated in 2011, current science on old growth and related species was not added to the references. Certainly, more recent science is available to identify old growth stands. A thorough look at the most recent science is warranted before a claim is made that science from 1992 is the best available science. Green et al, or similar quantifying characteristics are not used in other forest regions. Green et al. are not, in and of themselves, sufficient protocols for determining old growth as stated on page 11. Field work is crucial to identifying old growth stands In Gold Butterfly field work was only used to spot check which is not what Green et al intended. What GIS vegetation layers were used in Gold Butterfly old growth analysis? Are they compatible with Green et al forest types? Please include a review of current science and other regional approaches to old growth identification.

Green et al. (1992) does not represent the best available science for the management of Old Growth. Even if Green et al. (1992) represents the best available science for **identifying** old growth in BNF, it does not represent the best available science for **managing** old growth. Numerous other, more recent publications give recommendations for the management of old growth and are discussed below. An important question, not answered in the Gold Butterfly DSEIS, is: How will BNF use Green et al's **identification** criteria to **manage** old growth on the Gold Butterfly project and other future and ongoing projects? FOB is concerned that BNF will use the new standards to cut more old and large trees. They will be able to do this in several ways: 1) Although GB DSEIS states (p. 2) "*treatment units containing old growth would retain their old growth status*", using Green et al allows old growth status in Ponderosa Pine/Douglas Fir to be retained if old/large trees are cut to their minimum of only 8 old/large trees per acre versus the 15 required in the existing Forest Plan, and the 17 per acre average of Green et al.; 2) BNF could use the new standards to eliminate the old growth habitat defined by the Forest Plan, thereby cutting more large trees; 3) Using Green et al's standards may bolster the old growth percentages above the Management Area (MA) minimums, thereby allowing old growth to be cut down to the MA minimums of 3-8%.

The DSEIS (p. 18) states: "*The 1987 Forest Plan requirement that old growth stands meet a minimum of 40 acres could be detrimental to wildlife species associated with mature or over-mature forests or old forest components because patches of old growth less than 40 acres could be removed and still meet the 1987 Forest Plan standard.'* A similar argument can be used against the proposed amendment: that it could remove stands that do not quite meet the age requirements, but that are already functioning as old growth habitat for some species. For example, DSEIS, p. 19, claims "*Pileated woodpeckers and marten are not old growth dependent species. They are associated with mature and over-mature forests that contain habitat components such as large trees, large snags and down woody material that are often found in old growth forests, but also utilize younger forests that contain some of those habitat components. Therefore, forests that do not meet the old growth definitions can and do provide habitat that contributes to the viability of these species at several scales……While pileated woodpeckers are often associated with mature forests, the presence of large trees or snags for nesting is reported to be more important than forest age.* But the proposed amendment will allow BNF to cut the mature

and over-mature forests you discuss above, so it appears that the proposed amendment could be detrimental to pileated woodpeckers and marten, who apparently do not have a minimum tree-age requirement (see the section on wildlife effects below for more detail). The use of Green et al instead of the forest plan standards for old growth affects pileated woodpeckers that rely on large trees (>20 dbh) for nesting. It also affects pine marten that rely on mature forests. NFMA directs forests to **maintain and improve** habitat of Management Indicator Species (MIS). The use of Green et al instead of forest plan standards is in violation of NFMA.

Without data and maps comparing the acreage of Forest Plan old growth to Green et al old growth, it is impossible to assess the effects of the proposed amendment. Please provide existing percentages for old growth habitat by management area and drainage using Forest Plan standards to compare with the percentages using the Green et al standards in the DSEIS, p. 12. Please provide maps of the project area comparing old growth using the two different standards.

In focusing on the minimum criteria for old growth, BNF ignores other results of Green et al, most importantly that they surveyed 4,847 plots of Western Montana, Zone 1, Ponderosa-Doug Fir-Western Larch old growth and found an average of 17 old growth trees per acre (well above their minimum of 8), along with 6 snags per acre (no minimum requirement). Therefore, it appears that Green et al were establishing minimum criteria and not advocating that 8 trees per acre were plenty. Their management recommendations (p. 12) advise caution, and to remember that old growth stands are irreplaceable within human life spans:

"old growth is valuable for a whole host of resource reasons such as habitat for certain animal and plants, for aesthetics, for spiritual reasons, for environmental protection, for research purposes, for production of unique resources such as very large trees. Unusual natural communities, etc., the resource values associated with potential old growth stands need to be considered in making allocations.

At the same time, there may be some stands with trees so large or so old that they are unique. We should always maintain a good representation of these very old unique and outstanding stands, because they are irreplaceable within human life spans. Remember to value the truly unique and outstanding, wherever it may be."

Certainly, the use of Greene et al minimum numbers to manage old growth would put old growth stands at peril. The amendment does not take into account blowdown. It is common for blowdown to occur when surrounding trees are removed. Even cutting to 10 or 12 trees per acre could reduce the stand to less than minimum requirements.

BNF fails to analyze the proposed amendment's significance in the context of the larger Gold Butterfly FEIS, particularly concerning subsequent management of old growth and also the cumulative impact with the proposed CWD site-specific amendment. Amending old growth standards (identification standards) does not stand alone; BNF must disclose how old growth will be **managed** under a new definition. Many scientists have provided management recommendations for old growth, and all recommend retaining all or nearly all old/large trees (Yanishevsky; 1994; Hessburg et al., 2015; Fielder et al., 2007a,b; Wales et al., 2007). Rapp (2003) states "*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."*

Fielder et al (2007b) state that "*old-growth functions increase as numbers of large trees, snags, and downed logs increase*", again suggesting more is better. Green et al (1992) specified a minimum basal area of 60 ft^2/acre, and Fielder et al's (2007a) recommendations stated: *"Reserve basal areas of 10–18 m^2 per hectare (45-80 ft^2/acre) are prescribed for post-treatment stands. Densities at the high end of this range (80 ft^2/acre) are retained in stands dominated by large trees*." None of these other references are included or discussed in the DSEIS or the Gold Butterfly FEIS, which speaks to our concern that the proposed amendment will be used to cut, rather than preserve, old growth. In fact, the Mud Creek ROD (p. B-22) states: "*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*." (emphasis added) Apparently, then, some old growth stands on the Mud

Creek project, which is using the same old growth amendment, will be cut to the minimum, validating our concerns. How will the minimum threshold of snags comply with forest plan standard #3, "All snags that do not present an unacceptable safety risk will be retained"?

It is not clear why the DSEIS (p. 12-13) lists perceived threats to old growth. These threats include: decreasing Ponderosa Pine composition, greater susceptibility of Doug Fir and Ponderosa Pine to insects and disease due to drought, Ponderosa Pine loss from the ongoing mountain pine beetle epidemic, loss of Doug Fir and Spruce from mistletoe and bark beetles, mortality of White Bark Pine from mountain pine beetle, and severe fire due to large numbers of dead and dying trees. Are you implying that the amendment will reduce these risks? If so, how? By allowing more timber to be cut?

Please disclose how the proposed amendment will affect your management of old growth in the Gold Butterfly project, including specific treatments planned for old growth, how many old/large trees will be retained per acre, and minimum post-treatment basal area for units with old growth. Please show how you will be managing old growth under the Green et al standards, the differences in management between using the Forest Plan standards and the Green et al standards, and how that management will incorporate the best available science references cited above. Please analyze the proposed amendment's effects together with the proposed CWD site-specific amendment (Gold Butterfly FEIS).

BNF fails to analyze the proposed amendment's significance in the context of the larger Gold Butterfly FEIS, particularly concerning subsequent management of old growth and also the cumulative impact with the proposed EHE site-specific amendment.

The EHE site specific amendment has been used multiple times as explained below. It will also be used in the mud creek project and presumably the Bitterroot Front project. BNF proposed a programmatic forest plan amendment for Elk Habitat Objectives on December 18, 2019. The public commented and the process remains in limbo. It seems just doing site specific amendments for every project except CE's where it is illegal is easier than taking a hard look and completing a more thorough NEPA process and analysis of effects across the forest that a programmatic forest plan amendment would require.

We incorporate our EHE Forest Wide Amendment scoping comments dated February 10th 2020 (Attachment J) concerning the programmatic amendment to elk objectives. Please analyze the issues and effects that are described in the comments as they relate to the proposed old growth amendment and all other amendments proposed in the Gold Butterfly DEIS. Since it has been used repeatedly over much of the forest, please analyze these effects forest-wide.

Agency Ignores Court Directive Regarding Misuse of Site-specific Plan Amendments

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 to address unique characteristics of a particular area, not conditions common to an entire forest. In a situation similar to the proposed Gold Butterfly project, a court held that a FS failure to explain how 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."[1] Because, over a recent 12-year period, the BNF used EHE site-specific amendments on

[1] *League of Wilderness Defenders, et. al. v. Connaughton, et al.*, plaintiffs challenged that the Snow Basin project area did not have distinguishing characteristics, and therefore, a site-specific amendment was not justified. No. 3:12-cv-02271-HZ (D. Or. Dec. 9 2014). The court agreed with the plaintiffs, holding the agency's decision to make site-specific amendments arbitrary and capricious because the Forest Service failed to explain what conditions within the project area supported selection of a site-specific amendment over a forest-wide amendment. Id. at 54-55. The

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.

Please justify the BNF's continued misuse of site-specific Forest Plan Amendment, especially considering the fact that the current FP has not been updated as directed by current rules and regulations. Please explain why all BNF projects should not be put on hold until such time as the FP is updated.

BNF fails to analyze the effects of the old growth amendment on wildlife as compared to effects using the Forest Plan standards for the Gold Butterfly project. Wildlife species possibly detrimentally affected include cutthroat trout, bull trout, grizzly bear, lynx, fisher, elk, multiple migratory bird species, cavity-nesting birds (snag habitat), bats, raptors, red squirrels, wolverine, marten, etc. Possible detrimental effects on pine marten and pileated woodpeckers have already been discussed above. The minimum number of Old Growth trees under Green et al. may be too low for Flammulated Owls, a Montana Species of Concern and a U.S. Forest Service Sensitive Species, according to the Montana Field Guide: "*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.*" On the Gold Butterfly project, if the Green et al old growth standards result in more commercial timber harvest than the Forest Plan standards would allow, then habitat would likely be fragmented and degraded, and more roads might be built.

The DSEIS (p. 20) states that: "*A project-specific amendment to support using the old growth definitions in Green et al. for the Gold Butterfly project rather than the existing Plan old growth criteria would not result in negative direct or indirect effects to old growth or to wildlife species associated with mature or over-mature forest structure*". However, that statement does not constitute a "hard look" as is required by NEPA. The DSEIS includes no documentation which indicates the Agency performed any research or post-project monitoring of past management actions that allows for a comparison of wildlife impacts from Forest Plan old-growth treatments vs. the proposed Green amendment old-growth treatments.

Please compare and contrast the effects on wildlife using Forest Plan old growth standards versus Green et al standards on the Gold Butterfly project.

BNF fails to comply with the Forest Plan for recruitment of old growth. Other than the two units in the Como project mentioned in this paper, we can find no evidence that BNF has done due diligence to recruit old growth to comply with management area standards for old growth in the past 26 years. Projects have had third order drainages lacking in old growth, but no management activities were designed to rectify the situation in the project area. Projects merely kept the current level of old growth stable. It seems BNF has been in violation of much more than using Greene et al.

Forest Service ignores Effects of Management Activities on Wildlife Species and Violates NEPA and NFMA Requirements. The DSEIS (at 20) states that:

> A project-specific amendment to support using the old growth definitions in Green et al. for the Gold Butterfly project rather than the existing Plan old growth criteria would not result in negative direct or indirect effects to old growth or to wildlife species associated with mature or over-mature forest structure.[2]

That statement does not constitute a "hard look" as is required by NEPA. The DSEIS includes no documentation which indicates the Agency performed any research or post-project monitoring of past management actions that

---

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." Id.

allows for a comparison of wildlife impacts from FP (1987) old-growth treatments vs. the proposed Green amendment old-growth treatments.

Courts have held that a "hard look" includes studying not only research that affirms a specific management action but analyzing research that contradicts that same action.

> "NEPA's 'hard look' obligation requires agencies to consider potential environmental impacts, including all foreseeable direct and indirect impacts, and should involve a discussion of adverse impacts that does not improperly minimize negative side effects." WildEarth Guardians v. U.S. Bureau of Land Mgmt., 2020 WL 2104760, at 3 (D. Mont. 2020) (quotations and citations omitted).
>
> NEPA's "hard look" requirement does not permit "a soft touch or brush-off of negative effects." Native Ecosystems Council v. U.S. Forest Serv., 428 F.3d 1233, 1241 (9th Cir. 2005).

In the case Ecology Center inc. v. Austin (2005), the 9th Circuit Court held that "… the Forest Service's decision to treat old-growth violates, both NFMA and NEPA, … ." Specifically, the Court said that:

> 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 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."

It is quite revealing that the Reference List of the DSEIS contains nothing with a publication date more recent than 2006. The unwillingness to accept that science is "a dynamic never ending, self-correcting process." and then act accordingly disregards science.

There is an abundance of readily available wildlife research published after 2006 which is applicable to this proposed project. Please explain in detail how the Gold Butterfly information made available (by the Agency) to the Public constitutes a "hard look."

DSEIS fails to address recent science on project effects to Canada Lynx and the proposed amendment effects on canopy cover. The acreage covered by the proposed Gold Butterfly project is a heavily used place for recreation. Already heavily roaded, it is used by Off Road Vehicles (ORV), hunters, and during the winter months, Snowmobiles. The trail systems are used by hiker, runners, and equestrians. As Squires et al. points out, modifications/reductions to forest canopy cover increase motorized winter use and decrease critical habitat for Canada lynx.

The functional response of Canada lynx to increasingly avoid areas selected by motorized recreationists and share landscapes at fine scales with nonmotorized users provides land managers a useful framework to consider recreation impacts. The environmental gradients that are most important for managers to consider when evaluating potential disturbance between lynx and recreationists are forest canopy closure, road density, annual precipitation, and slope.

For example, given the sensitivity of Canada lynx and winter recreationists to changes in forest canopy cover, management actions that modify forest canopy cover through tree removal in recreation areas, whether for silviculture or fire/fuels management, could increase the spatial footprint of motorized winter recreation and decrease critical habitat for Canada lynx, especially in mid-elevation forests located on north-facing slopes. (Squires 2019)

Finally, The Biological Assessment for Canada lynx documents the importance of peripheral areas as:

Peripheral populations may contain valuable genetic, physiological or behavioral adaptations that are unique to their ecological success. Because suitable habitats in areas where populations act as metapopulations are spatially separated, the persistence of a metapopulation is dependent on the efficiency and success of dispersing animals in reaching isolated patches of suitable habitat. When patches are fragmented and connections between patches do not exist, recolonization becomes problematic and the metapopulation may be unable to persist, even though patches of suitable habitat remain (Meffe and Carroll 1997 p21). Additional fragmentation and isolation of suitable habitat occurring as a result of land management activities can not only affect small isolated habitat patches supporting smaller populations but also large contiguous patches supporting higher population levels. USDA Forest Service 1999. Biological Assessment of the Effects of National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada Lynx. 149p.

Please analyze the effects of increased human activity, management activities in peripheral areas, and reduced canopy cover on Canada Lynx.

DSEIS fails to acknowledge the effects of the proposed amendment and management activities on wolverine that are present in the project area. The status of wolverine is still being decided in court.

- Copeland et at. studied the relationship between wolverine and spring snow coverage.

  We propose a fundamental geographic distribution for the wolverine (*Gulo gulo* (L., 1758)) based on the hypothesis that the occurrence of wolverines is constrained by their obligate association with persistent spring snow cover for successful reproductive denning and by an upper limit of thermoneutrality.

  All 562 reproductive dens from Fennoscandia and North America occurred at sites with persistent spring snow cover. Ninety-five percent of summer and 86% of winter telemetry locations were concordant with spring snow coverage.

  Reductions in spring snow cover associated with climatic warming will likely reduce the extent of wolverine habitat, with an associated loss of connectivity. (Copeland 2010)

- McKelvey et al. researched wolverine dispersal patterns in relationship to global warming.

  Areas that retain snow cover throughout the 21st century are British Columbia, north-central Washington, northwestern Montana, and the Greater Yellowstone Area. By the late 21st century, dispersal modeling indicates that habitat isolation at or above levels associated with genetic isolation of

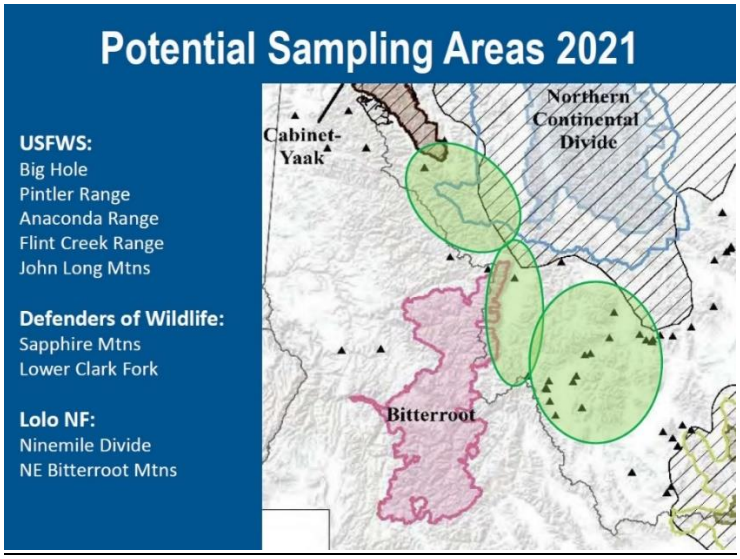
wolverine populations becomes widespread. Overall, we expect wolverine habitat to persist throughout the species range at least for the first half of the 21st century, but populations will likely become smaller and more isolated.

We expect that the geographic extent and connectivity of suitable wolverine habitat in western North America will decline with continued global warming.

… conservation efforts should focus on maintaining wolverine populations in the largest remaining areas of contiguous habitat and, to the extent possible, facilitating connectivity among habitat patches. (McKelvey 2011)

Rather than do everything possible to conserve suitable habitat for wolverine (including the retention of canopy cover to the slow spring melt), with this proposed project, the FS's management activities will certainly reduce or remove habitat that the wolverine who currently live in the project's area depend upon. Please analyze proposed amendment effects on spring snowmelt and habitat connectivity for wolverine.

DSEIS fails to analyze the effects of the amendment on grizzly bears and fails to recognize the importance of the project area on grizzly bears. USFWS is currently conducting DNA research to establish the presence of grizzlies in the project area as shown in the presentation slide below presented at a recent NCDE subcommittee meeting.



In the case of Endangered Species Act listed species such as grizzly, Section 7 of the ESA imposes a duty to conserve those listed species and to act to achieve survival and recovery of the species (*Sierra Club v. Glickman*, 156 F3d 606 (5th Cir 1998)). The requirement to contribute to recovery is core to the ESA statute and necessary in order to achieve its stated goal to conserve species and the ecosystems upon which they depend.

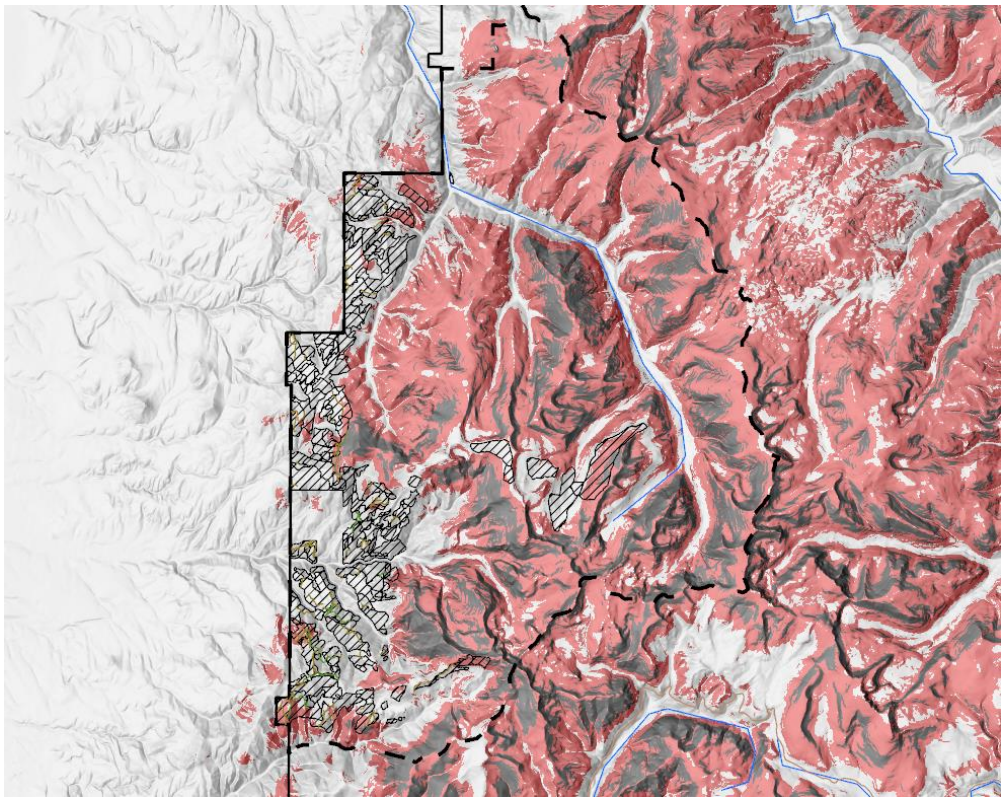
The Forest Service cannot rely on the screens for the R1 programmatic grizzly bear BA as a rationale to forego proper environmental analysis and implement these treatments without demonstrating they will not harm grizzly bears or grizzly bear recovery. Due to recent sightings and more focus on connectivity by USFWS, the Lolo National Forest is currently revising their forest wide grizzly bear BA as should BNF. The agency cannot rely solely on the FWS May be Present Map to determine the potential impacts to grizzly bears in the project area as the location dates the FWS used to generate the maps do not reflect recent grizzly bear sightings within or near

the project area. Specifically, the location date for the Threemile Creek watershed is 1/17/2013 and for the Town of Stevensville-Burnt Fork Bitterroot River watershed it is 2/12/2017. When a male grizzly bear was captured on the Whitetail Golf Course north of Stevensville in 2018, Montana FWP bear specialist Jamie Jonkel was quoted in a Missoulian article saying:

> "I'm guessing he came out of the Blackfoot drainage," Jonkel said ahead of lab results on the DNA samples he took from the Stevensville grizzly. "He probably came south through the Garnet Range, got across the Clark Fork (River) and I-90. There are a handful of spots that allow for passage around Rock Creek and Clinton and Drummond. If they find those — bang — they're south of I-90 and into the Sapphires."

Such sightings reflect the need for the Forest Service to consider much of the Sapphire Mountain range as areas suitable for grizzly bear connectivity. In fact, a new report titled, *Grizzly Bear Denning Habitat and Demographic Connectivity in Northern Idaho and Western Montana*, authored by independent wildlife consultant Mike Bader and geospatial analyst/wildlife biologist Paul Sieracki identify areas where female grizzly bears can reside year-round between the Northern Continental Divide, Cabinet-Yaak, and Bitterroot Grizzly Bear Recovery Areas. They note, "The Sapphire and Pintler Ranges, where there have been persistent verified observations of grizzly bears (Jonkel, MDFWP 2021) and where berry-producing shrubs important to grizzly bears are abundant (Hogg et al. 2001) has the largest amount of secure core habitat in the largest sizes …"

These areas serve as ideal habitat for grizzly bear demographic connectivity and the report illustrates the importance of what the authors label the Sapphire Complex. The graphic below shows the project area and potential denning habitat.



Bader Sieracki Denning Habitat 2021: Black indicates best denning habitat and red indicates moderate denning habitat. Project area and units outlined and hatched.

With climate change and so many other pressures on grizzly bears, there is need to protect suitable grizzly bear denning habitat and areas of connectivity and restore areas that can facilitate recovery. The areas within the project area identified as "low quality" grizzly bear denning habitat by Bader & Sieracki, 2021 should be prioritized for improving current levels of habitat security. Some units overlap prime Even if project activities do not overlap denning habitat, work will still have impacts on den selection and security. High quality denning habitat accounts for a small percentage of total suitable denning habitat, so any impact on high quality areas would be a violation of the ESA. There are a number of units that should be removed or modified due to proximity to denning habitat especially the easternmost unit. Administrative traffic and noise due to harvesting activities in winter have the same effects as open roads on grizzly bears. Human activities within 200m of an occupied den can cause physiological changes such as increased heart and breathing rate, wakefulness and even den abandonment leading to increased cub mortality (Linnell et al. 2000).

Please reassess the forest wide Biological Assessment for grizzly bears and provide a revised Biological Assessment taking new information and recent sightings in the Sapphires. Please provide the revised Biological Opinion before the final ROD.

DSEIS does not take into consideration new trapping laws and their effects on endangered and sensitive species in the project area especially the construction of roads of any type in old growth. Please analyze the cumulative effects of new trapping and hunting regulations on wildlife with proposed project activities.

DSEIS does not take into consideration the newly released US Fish and Wildlife Service (USFWS) Birds of Conservation Concern 2021. The flammulated owl is on the 2021 list (Attachment H), yet there are no considerations listed in the DSEIS or the FEIS to protect them. The Gold Butterfly Project proposes the construction of a road that runs right over a known flammulated owl nesting site and another road is slated for construction in a suspected nesting site. This is not only in violation of the Migratory bird act, it is also in violation of the Forest Plan: Forest-wide Management Standard II.F.1.e(16). Please do due diligence and do timely surveys for flammulated owl nesting sites in the project area and modify roads and treatments the project to avoid any incidental take of flammulated owls and analyze the effects of the proposed actions and the proposed amendment on birds of conservation as mandated by the Migratory Bird Treaty Act.

The above examples reveal that the Agency is ignoring the most recent science while it continues to maintain the deception that management actions of all kinds, including thinning and logging of old-growth stands, have no meaningful effect on wildlife

Recently, the FS hired a group of forestry and legal experts, headed by Martin Nie,[3] to research who had the ultimate responsibility for managing and protecting wildlife—the states or the federal government—on federally managed lands. Using extensive research of U.S legal documents and case law, the group established that federal agencies have the ultimate responsibility for managing and protecting wildlife.[4] The FS has the ultimate responsibility to not only manage and protect wildlife habitat, but also protect the wildlife. (Nie 2017)

[3] Professor, Natural Resource Policy; Director, Bolle Center for People & Forests; Undergraduate Program Director, Resource Conservation, University of Montana

[4] Nie, M. et al. (2017) Fish and Wildlife Management on Federal Lands Debunking State Supremacy - https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2980807

The prevailing pretense that wildlife management on federally managed public land is the purview of the State (Montana) and not federal agencies is not supported by case law. The BNF should admit to that responsibility and, when proposing this project, act accordingly.

DSEIS does not acknowledge that Whitebark Pine is now proposed for listing with the Endangered Species Act. This project requires a consultation with USFWS on whitebark pine.

DSEIS fails to analyze the cumulative effects of nearby projects proposed since the ROD like Buckhorn, Eastside, and Calf Creek. Please analyze the cumulative effects of nearby projects proposed after the ROD including the old growth amendment.

DSEIS does not consider recent national direction. 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).]

The 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 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]

Please quantify GHG emissions as required by law. 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. Quantitative tools are readily available, so the FS must comply.[6]

BNF fails to analyze the effects of the proposed old growth amendment on climate change and carbon sequestration. Large, old trees store disproportionately large amounts of carbon, as carbon storage dramatically increases with size (dbh) (Mildrexler et al, 2020; Stephenson et al, 2014). With future climate crises probable, retaining large, old trees will not only help mitigate or buffer climate change, but will benefit ecosystems in other ways through their biodiversity and resilience to fire, disease, and drought. Will using the proposed amendment result in more large trees cut than if the Forest Plan standards were used? Will using the proposed amendment result in more commercial timber production than using the Forest Plan old growth standards? Numerous researchers (Campbell et al, 2011; Harris et al, 2016; Law and Warring, 2015; Law et al, 2017;

[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

Reinhardt and Holsinger, 2010; Stenzel et al, 2019) have found that logging emits significant atmospheric carbon, much more than wildfires. Logging old forests in particular worsens climate change by releasing significant amounts of carbon and by preventing such forests from continuing to sequester carbon. As the Forest Service has admitted regarding mature forests in Alaska, such forests "likely store considerably more carbon compared to younger forests in this area (within the individual trees themselves as well as within the organic soil layer found in mature forests)." Forest Service, Tongass Land and Resource Management Plan, Final EIS (2016) at 3-14, excerpts attached as Attachment A. This is so because when a forest is cut down, the vast majority of the stored carbon in the forest is released over time as CO2, thereby converting forests from a sink to a "source" or "emitter." *See, e.g*., D. DellaSala, The Tongass Rainforest as Alaska's First Line of Climate Change Defense and Importance to the Paris Climate Change Agreements (2016) at 5, attached as Attachment B. According to a 2019 IPCC report, deforestation causes climate pollution, and avoiding deforestation will reduce climate pollution. Intergovernmental Panel on Climate Change, Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems, Summary for Policymakers (Aug. 2019) at 7, 23, attached as Attachment C. *See also* B. Law et al., Land use strategies to mitigate climate change in carbon dense temperate forests, Proceedings of the Nat'l Academy of Sciences, vol. 115, no. 14 (Apr. 3, 2018) at 3663 ("Proven strategies immediately available to mitigate carbon emissions from forest activities include ... reducing emissions from deforestation and degradation."), (Attachment D).

A 2019 report found that protecting national forests in the American Northwest, including in Montana, would be an effective way to reduce the contribution of land management to climate pollution. The study concludes:

> If we are to avert our current trajectory toward massive global change, we need to make land stewardship a higher societal priority. Preserving temperate forests in the western United States that have medium to high potential carbon sequestration and low future climate vulnerability could account for approximately 8 yr of regional fossil fuel emissions, or 27–32% of the global mitigation potential previously identified for temperate and boreal forests, while also promoting ecosystem resilience and the maintenance of biodiversity.

P. Buotte *et al*., *Carbon sequestration and biodiversity co-benefits of preserving forests in the western United States*, Ecological Applications, Article e02039 (Oct. 2019) at 8, available at https://esajournals.onlinelibrary.wiley.com/doi/pdf/10.1002/eap.2039 (last viewed July 29, 2021), and attached as Attachment E. This study was funded in part by the USDA. The coarse-scale map provided with the study indicates that there may be forest stands in the project area that are rated as "medium" or "high" priority for preservation to mitigate climate change. *Id*. at 4 (Figure 1).

Recent studies agree that maintaining forests rather than cutting them can help reduce the impacts of climate change. "Stakeholders and policy makers need to recognize that the way to maximize carbon storage and sequestration is to grow intact forest ecosystems where possible." Moomaw, *et al*., Intact Forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good, Frontiers in Forests and Global Change (June 11, 2019) at 7), attached as Attachment F (emphasis added). One report concludes:

> *Allowing forests to reach their biological potential for growth and sequestration, maintaining large trees* (Lutz et al 2018), reforesting recently cut lands, and afforestation of suitable areas *will remove additional CO2 from the atmosphere*. Global vegetation stores of carbon are 50% of their potential including western forests because of harvest activities (Erb et al 2017). Clearly, western forests could do more to address climate change through carbon sequestration *if allowed to grow longer*.

T. Hudiburg *et al*., Meeting GHG reduction targets requires accounting for all forest sector emissions, Environ. Res. Lett. 14 (2019) (emphasis added), attached as Attachment G.

Further, a June 2020 literature from leading experts on forest carbon storage reported:

> *There is absolutely no evidence that thinning forests increases biomass stored (Zhou et al. 2013).* It takes decades to centuries for carbon to accumulate in forest vegetation and soils (Sun et al. 2004, Hudiburg et al. 2009, Schlesinger 2018), and it takes decades to centuries for dead wood to decompose. We must preserve medium to high biomass (carbon-dense) forest not only because of their carbon potential but also because they have the greatest biodiversity of forest species (Krankina et al. 2014, Buotte et al. 2019, 2020).

B. Law, et al., The Status of Science on Forest Carbon Management to Mitigate Climate Change (June 1, 2020), attached as Attachment D.

Together, these studies demonstrate the value of retaining old growth for sequestering atmospheric carbon and the harmful release of carbon from logging activities. As such it is imperative for the Forest Service to compare estimated carbon emissions and carbon sequestration using Green et al's standards versus the Forest Plan standards on the Gold Butterfly project, and in comparison to the alternative we proposed.

The Gold Butterfly DSEIS documentation includes no serious analysis of climate change and fails to address the issues we raise above. In addition, the documentation included with the DEIS and FEIS sidestep the increasingly important issue of global warming. Those omissions are ecologically dangerous.

Given the urgency of minimizing additional greenhouse gas emissions and increasing carbon sequestration to protect the earth's climate system, it would be best to protect trees for their carbon stores and for their co-benefits of habitat for biodiversity, resilience to drought and fire, and microclimate buffering under future climate extremes.

According to a 2021 article, "Keeping trees in the ground where they are already growing is an effective low-tech way to slow climate change."[7] (Law 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.[8] (Achat 2015)

"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

[7] Law, B.E. and Moomaw, W.R (2021) Keeping trees in the ground where they are already growing is an effective low-tech way to slow climate change - https://theconversation.com/keeping-trees-in-the-ground-where-they-are-already-growing-is-an-effective-low-tech-way-to-slow-climate-change-154618

[8] Achat, D.L. et al.(2015) Quantifying consequences of removing harvesting residues on forest soils and tree growth - A meta-analysis - https://www.sciencedirect.com/science/article/abs/pii/S0378112715001814?via%3Dihub

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."[9]

The project documentation (DEIS, FEIS, or DSEIS) provides only trivial analysis of the interaction and connection between the proposed management actions and global warming.

Vegetation management efforts that attempt to replicate how the FS thinks forests looked pre-European influence, ignores the larger pattern of climate, climate change, and ignores natural succession. The scoping documentation for this project clearly shows that the Agency continues its attempts to replicate an imagined past and reveals its refusal to accept that global warming has made such an endeavor impossible and irrational. In particular, the agency's analysis still fails to demonstrate how the desired condition, even if achieved through vegetative treatments, will thrive under changing climate conditions or if such resistance strategies will ultimately fail due to increased drought and other climate crisis effects. The agency needs to shift its management approach to incorporate the likelihood that no matter what vegetation treatments it implements, there are going to be future forest wildfire-triggered conversions to other vegetation types and that the Forest Service cannot rely on the success of resistance strategies, as Coop 2020 et al. explains:

> Contemporary forest management policies, mandates, and science generally fall within the paradigm of resisting conversion, through on-the-ground tactics such as fuel reduction or tree planting. Given anticipated disturbance trajectories and climate change, science syntheses and critical evaluations of such resistance approaches are needed because of their increasing relevance in mitigating future wildfire severity (Stephens et al. 2013, Prichard et al. 2017) and managing for carbon storage (Hurteau et al. 2019b). Managers seeking to wisely invest resources and strategically resist change need to understand the efficacy and durability of these resistance strategies in a changing climate. Managers also require new scientific knowledge to inform alternative approaches including accepting or directing conversion, developing a portfolio of new approaches and conducting experimental adaptation, and to even allow and learn from adaptation failures. Coop et al., 2020

<u>In light of the uncertainties these studies pose, please provide the most recent scientific research which supports the Agency's belief that the FS should continue its (so far unsuccessful) attempts to replicate (unsubstantiated) pre-European forest conditions and how those conditions are more resilient and healthier than current forest conditions. Please justify how attempts to replicate imagined historical conditions contribute to efforts to mitigate the effects of global warming.</u>

BNF in both FEIS and DSEIS fails to analyze pertinent information concerning project activities. For example, recent research related to wildfire, prescribed burning, management activities, and elk includes:

- Long et al. evaluated the effects of mechanical thinning and prescribed fire on forage availability for elk.

  > Use of mechanical thinning and prescribed fire to reduce fuels in dry forest ecosystems has become increasingly common in western North America. Nevertheless, few studies have quantified effects of

[9] Achat, D.L. et al.(2015) ibid.

fuels reduction treatments on wildlife. We evaluated effects of fuels reduction on quantity and quality of forage available to elk (Cervus elaphus) in northeastern Oregon.

Quantity and quality of forage were lower in summer than spring in both stand types. In contrast, total cover of forage was higher in treatment than in control stands during spring, whereas the opposite was true during summer. (Long 2008)

- Proffitt et al. performed a study comparing the impact of wildfire, prescribed burning, and management practices on elk forage quantity and quality. They found that wildfire produced higher summer forage quality than prescribed fire.

  Summer forage quality peaked in recently burned forests and decreased as time since burn increased. Summer forage abundance peaked in dry forests burned 6–15 years prior and mesic forests burned within 5 years. Forests recently burned by wildfire had higher summer forage quality and herbaceous abundance than those recently burned by prescribed fire. These results suggest that the nutritional carrying capacity for elk varies temporally with fire history and management practices.

  Wildfires tended to increase the quality and abundance of nutritional resources, with the highest-quality forage occurring in forests burned within the past 5 years and the highest abundance generally occurring in forests burned 6–15 years ago. Prescribed fires in recently burned forests less strongly increased the quality and more strongly reduced the abundance of nutritional resources than wildfires in same-stage forests. (Proffitt 2019)

- A study by Cook et al. found that summer forage is the most important factor for the winter health and survival of elk.

  …, summer nutrition set limits to rates of body fat accrual of lactating females that in turn limited body condition across the annual cycle.

  Overall, our data failed to support 2 common assumptions: 1) summer and early autumn foraging conditions are typically satisfactory to prevent nutritional limitations to adult fat accretion, pregnancy rates, and calf and yearling growth; and 2) winter nutrition and winter weather are the principal limiting effects on elk productivity. Instead, a strong interaction existed among level of summer nutrition, lactation status, and probability of breeding that was little affected by winter conditions—adequacy of summer nutrition dictated reproductive performance of female elk and growth as well as growth and development of their offspring in the Northwest and Rocky Mountains. (Cook 2013)

The proposed Gold Butterfly project includes a substantial amount of prescribed burning, much of it in old growth. Taken together, these three studies indicate that prescribed burning does not produce the most nutritious summer forage when compared to either wildfire or control areas that receive no management activities. Also revealed is the fact that summer the quality and quantity of summer forage is the most important factor for the over-winter health and survival of elk.

<u>Please justify why the BNF plans springtime prescribed burns in the proposed-project area when recent research indicates that management activity degrades elk summer forage quantity and quality based on the best available science.</u>

- Espinosa et al. addressed the relationship between Best Management Practices (BMPs) and salmonids.

Available data and analyses consistently indicate that the vast majority of watersheds managed for "multiple uses" exhibit degraded conditions in their fish habitats (Sedell and Everest, 1990; Platts and Chapman1, 992; and Isaacson, 1994).

…, recovery is an anticipated spin-off from further development. For example, by harvesting trees in a floodplain, rehabilitation funds for use in the riparian zone can be generated. Or, rather than building a new primitive unsurfaced road, gravel is added to the road surface to lower sediment delivery in a watershed where cumulative sediment delivery is already above impact thresholds. BMPs then are merely means to reduce the level of impact given a decision to proceed with development.

An integral part of that prevailing management effort that has persisted into today's thinking is the idea that BMPs adequately protect aquatic resources. Stanford and Ward (1992) have labeled the BMP paradigms a prime example of the "illusion of technique" process that is in vogue today (R. Behnke, Colorado State University, as cited in Stanford and Ward, 1992). The authors describe the process as a mere "formalization and synthesis of best professional judgment" with no ecological rationale that is empirically based.

A great deal of the failure to protect salmonid habitat can be attributed to this philosophy and illusion. It could be more appropriately named" least management practices." BMPs are subject to a wide spectrum of interpretation--frequently by disciplines not qualified to apply measures to protect salmonid habitat or that have other resource objectives in mind. Therefore, the least effective practices are frequently applied. BMPs are contingent upon economic considerations and are habitually diluted or dropped because they are not economically feasible. BMPs do not deal with cumulative effects and the recovery of impacted watersheds. In fact, they promote cumulative effects and do not allow recovery because there are no watershed or fish habitat standards (criteria) regulate or stop the application of practices. As long as BMPs are applied, habitat conditions are assumed to be fine regardless of existing watershed conditions and regardless how much land is subjected to impacts provided that BMPs are employed. Subjective assessments are too easily influenced by managers looking for facile answers to complex problems (the free lunch syndrome). Mechanistically, the concept functions like a perpetual motion machine. BMPs cannot protect a watershed from excessive development. This philosophy has unequivocally failed to provide adequate protection for salmonid habitat.

In dealing with severely degraded water sheds and habitats, it is likely that zero sediment delivery over natural is the appropriate threshold for recovery (Heede, 1980). With degraded watersheds, the notion that moderated logging would allow recovery simply did not work (Phase I Report, 1992). Watersheds did not recover, or they were further degraded (op. cit., 1992).

"Recovery" was predicted from modeling efforts and not real data. In addition, modeled recovery in the distant future was traded for near-term continued improvement in habitat quality. (Espinosa 1997)

- Further confirming the older findings of Espinosa et al., the USDA Forest Service performed its own study and found that only:

  …, 61 percent of the BMP implementation evaluations were rated as "Fully Implemented" or "Mostly Implemented," 65 percent of the BMP effectiveness evaluations were rated as "Effective" or "Mostly

Effective," and 56 percent of the sites where BMP implementation and effectiveness were both monitored had composite ratings of "Excellent" or "Good." (Carlson 2015)[10]

Although claiming one of the purposes for this proposed project is to reduce chronic sediment sources, the Agency has a long history of neglecting the upkeep of previous installations that were referred to as BMPs. Although this proposed project included BMPs, given its history of negligence, there is no reason to believe the Agency will miraculously begin the maintenance required to keep BMPs installations operating correctly. Please justify how BMPs in the proposed-project area will be maintained in the future given the Agency's current inability to maintain existing roads on the BNF. Please also demonstrate funding earmarked for this work.

DSEIS fails to consider new information concerning large openings and their deleterious effect on fire behavior. The Gold Butterfly Project includes 14 regeneration cuts (clearcuts) over 40 acres totaling 1508 acres. Nine openings are over 100 acres with one of 234 acres. A recent study by Atchley et al 2021, shows that large openings can affect wind entrainment speeding up localized and mean wind speeds resulting in "faster fire spread" (see Atchley p. 9). And "turbulent wind conditions in large openings resulted in a disproportional increase in TKE [Turbulence Kinetic Energy] and crosswinds that maintain fire line width (ibid p. 9). Certainly, faster and wider fires threaten communities and firefighters.

In a forest service publication called "Living with Fire," it states that with 20mph winds an open forest will burn at 150 miles per hour while a dense conifer forest will burn at 15 acres per hour (https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_020876.pdf . p 2 and 4) Another version of the same publication says that "dense conifer reproduction" the type that happens after a regeneration cut can burn at 650 acres per hour with 20 mph winds. (https://firesafemt.org/img/LivingwFireFSM20091.pdf).
It seems large openings and even thinning are not wise ideas in light of climate change and increasing fire seasons. Again, they do not protect communities or firefighters. They have the potential to make communities and wildland firefighters more vulnerable.

Openings allow the sun to dry out the forest floor and the encourage the growth of grasses and other fine fuels that encourage ignition and propel fires. Dry fuels and high winds make fires more intense and faster. In the US Department of Agriculture Handbook 360 "Fire Weather: A guide for the application of meteorological information to forest fire control operations" and found at https://digitalcommons.usu.edu/barkbeetles/14/ states on page 51 that "The two most important weather, or weather-related, elements affecting wildland fire behavior are wind and fuel moisture." On page 64 it warns that "Logs under a forest canopy remain more moist (approximately 25% more moist) through the season than those exposed to the sun and wind."

Fires, even severe ones allow more carbon storage in the forest than thinning. Thinning and clearcutting removes carbon stores completely and use fossil fuels. Most of the trees are still standing and storing carbon in a local stand that severely burned near Ward Mountain in 1984. When they do fall, they will slowly release carbon over time versus an immediate loss of carbon stores caused by a large regeneration cut and thinning. These large openings include large, mature trees that store more carbon than smaller, younger trees. (Keith et al 2014)

Large openings are harmful to wildlife because their hiding cover and shade are removed from their habitat. Large openings are detrimental to soil which affects the future of our forests. Removing future coarse woody debris on the forest floor eliminates vital nutrients in future soil. Manufactured large openings are unsightly and

[10] The Forest Service expects the Public to believe that when BMPs are implemented, they are forever 100% effective after installation. Obviously, that is not the case.

unnatural. They do not mimic fires. The benefits of fire and seral forests are lost with large regeneration cuts. Seral forests are essential to forest health.

Please analyze an alternative that does not include these openings.

DSEIS fails to explore the potential impacts to human health and environment from the abandoned vermiculite mine in the project area.

"The top of Skalkaho Mountain, in the Sapphire Mountains about ten miles directly east of Hamilton, exposes an extraordinary igneous intrusion almost identical to the Rainy Creek stock near Libby." (Roadside Geology of Montana, Hyndman and Thomas, p.199) A deposit of vermiculite occurs within that igneous complex.

Mining vermiculite near Libby has ceased but continues to cause one of the most deadly environmental disasters in the U.S.

Near the Libby vermiculite mine they have special firefighting teams with containerized air assigned to fight fires due to amphibole asbestos in the tree bark and elsewhere that would go into the smoke. https://nbcmontana.com/news/local/possibility-of-asbestos-prompts-extra-precautions-for-firefighters-near-libby

The presence of (amphibole) asbestos at the Hamilton vermiculite mine has not been tested, but should be assumed to occur until proven otherwise, as is indicated by the following statement. "Several early attempts to mine vermiculite in the Skalkaho intrusion went poorly. While at one time that seemed unfortunate, now it is clear that we narrowly escaped having another major environmental disaster." (Roadside Geology of Montana, Hyndman and Thomas, p.199)

There has been a significant patch of bare ground created by mining and exploration up there for decades. If there is asbestos present the wind would have distributed it to some unknown extent and fire would liberate it into the smoke. Roads cut into the ultramafic complex also expose soil and rock possibly containing amphibole asbestos.

Even though the area is generally downwind of the Bitterroot Valley an east wind or katabatic wind could carry asbestos fibers, if present, into the Valley. Smoke from fires in the area could also settle into the Valley. Please conduct a thorough survey of amphibole asbestos in and near the mine.

Considering the recent Hannah Flats decision (Attachment K), we are concerned how you determined WUI boundaries for this HFRA project. Please describe in detail how the WUI boundary was determined for this project.

We would also like to bring the Forest Plan standard concerning beavers to the attention of BNF as a part of the public record. The Bitterroot National Forest plan states (p. II-20), "Beaver **will** be introduced into suitable riparian habitat. (emphasis added)." BNF has a long list of current and proposed projects that do not include management actions to reintroduce beavers. BNF has failed to comply with this standard for 30 years. Please analyze and implement a proposal to reintroduce beavers in fulfillment of your promise to the public.

Our intention is that all references and attachments be a part of the public record. If you are unable to access any of these references via the zip files submitted with this document, please contact us and we will happily provide them to you, news@friendsofthebitterroot.net

Thank you for considering our comments and pertinent science concerning the Gold Butterfly project and the draft SEIS.

Sincerely,

Jim Miller, President
Friends of the Bitterroot
PO Box 442
Hamilton, MT 59840
millerfobmt@gmail.com

Mike Garrity, Director
Alliance for the Wild Rockies
PO Box 505
Helena, MT 59624
wildrockies@gmail.com

Gail H Goheen & Steven S Goheen
345 W Main St
Hamilton, MT 59840
gail@goheenlaw.com

Sara Johnson, Director
Native Ecosystems Council
PO Box 125
Willow Creek, MT 59760
sjjohnsonkoa@yahoo.com

Adam Rissien
ReWilding Advocate
WildEarth Guardians
PO Box 7516
Missoula, MT 59807
406-370-3147
arissien@wildearthguardians.org

Attachments

A. Tongass NF Plan FEIS (2016) (excerpts).pdf
B. GEOS report - Tongass emissions final report compressed.pdf
C. IPCC - Land Use 2019 Summary for Policymakers.pdf
D. Law et al. Land use and climate change (2018).pdf
E. Buotte et al., Carbon Sequestration (2019).pdf
F. Moomaw et al., Proforestation (2019).pdf
G. Hudiburg, Life-Cycle Assessment (2019).pdf
H. Birds of Conservation Concern (2021) pdf
I. Como project ROD (2015) pdf
J. FOB EHE scoping comments (2020) pdf
K. Hannah Flats Order Filed (2021) pdf

References:

Achat, D. L. et al. 2015. "Quantifying consequences of removing harvesting residues on forest soils and tree growth – A meta-analysis." *Forest Ecology and Management.*

Atchley, et al 2021, "Effects of fuel spatial distribution on wildland fire behaviour." International Journal of Wildland Fire, https://doi.org/10.1071/WF20096.

Bader, M. and Sieracki, P. 2021. "Grizzly Bear Denning Habitat and Demographic Connectivity in Northern Idaho And Western Montana."

Campbell, J.L., Harmon, M.E., Mitchell, S.R., 2011, Can fuel reduction treatments really increase forest carbon storage in the western US by reducing future fire emissions? Frontiers in Ecology and Environment, doi:10.1890/110057.

Carlson, J. et al. 2015. "National Best Management Practices Monitoring Summary Report." *USDA Forest Service.*

Cook, R. C. et al. 2013. "Regional and seasonal patterns of nutritional condition and reproduction in elk." *Wildlife Monographs.*

Coop, Jonathan D Coop, Sean A Parks, Camille S Stevens-Rumann, Shelley D Crausbay, Philip E Higuera, Matthew D Hurteau, Alan Tepley, Ellen Whitman, Timothy Assal, Brandon M Collins, Kimberley T Davis, Solomon Dobrowski, Donald A Falk, Paula J Fornwalt, Peter Z Fulé, Brian J Harvey, Van R Kane, Caitlin E Littlefield, Ellis Q Margolis, Malcolm North, Marc-André Parisien, Susan Prichard, Kyle C Rodman, Wildfire-Driven Forest Conversion in Western North American Landscapes, *BioScience*, Volume 70, Issue 8, August 2020, Pages 659–673, https://doi.org/10.1093/biosci/biaa061

Copeland, J.P. et al. 2010. "The bioclimatic envelope of the wolverine (Gulo gulo): do climatic constraints limit its geographic distribution?" *Canadian Journal of Zoology.*

Espinosa, F.A. 1997. "Case History: The failure of existing plans to protect salmon habitat on the Clearwater National Forest in Idaho." *Journal of Environmental Management.*

Fiedler, C. E., P. Friederici, M. Petruncio, C. Denton, and W. D. Hacker. 2007a. Managing for old growth in frequent-fire landscapes. *Ecology and Society* **12**(2): 20. URL: http://www.ecologyandsociety.org/vol12/iss2/art20/

Fiedler, C. E., P. Friederici, and M. Petruncio. 2007b. Monitoring old growth in frequent-fire landscapes: *Ecology and Society* **12**(2): 22. URL: http://www.ecologyandsociety.org/vol12/iss2/art22/

Green, P. et al. 1992. *Old-growth Forest Types of the Northern Region.* Missoula, MT: USDA Forest Service, Northern Region.

Harris, N.L., and 6 others, 2016, Attribution of net carbon change by disturbance type across forest lands of the conterminous United States: *Carbon Balance Management, v. 11, 24 p.* DOI 10.1186/s13021-016-0066-5.

Hartwell, M.G., P. Alabeck, and S.F. Arno, 2000, Comparing Historic and Modern Forests on the Bitterroot Front *in* The Bitterroot Ecosystem Management Research Project: What We Have Learned: USDA-FS Rocky Mountain Research Station, General Technical Report RMRS-GTR-17 p. 11-16.

Hessburg, P.F., et al., 2015, Restoring fire-prone Inland Pacific landscapes: seven core principles: Landscape Ecology, v. 30, p, 1805–1835. DOI 10.1007/s10980-015-0218-0

Hyndman, Donald W., Thomas, Robert C., Roadside Geology of Montana, 2nd ed., 2020, p.199

Keith et al 2014, "Managing temperate forests for carbon storage: impacts of logging versus forest protection on carbon stocks." www.esajournals.org, *Ecoshpere*, June 2014, vol 5(6), article 75.

Law, B. E. and Moomaw, W. R. 2021. "The Conversation." February 22. Accessed June 26, 2021. https://theconversation.com/keeping-trees-in-the-ground-where-they-are-already-growing-is-an-effective-low-tech-way-to-slow-climate-change-154618.

Law, B.E., and Waring, R.H., 2015, Carbon implications of surrent and future effects of drought, fire, and management on Pacific Northwest forests: Forest Ecology and Management, v. 355, p. 4-14.

Law, B.E., Hudibug, T.W., Berner, L.T., Kent, J.J., Buotte, P.C., and Harmon, M.E., 2017, Land use strategies to mitigate climate change in carbon-dense temperate forests: PNAS, www.pnas.org/cgi/doi/10.1073/pnas.1720064115. *Logging is Oregon's biggestCO2 polluter, much more so than wildfire.*

Linnell, J D. C, Swenson, J. E, Andersen, R and Barnes, B., 2000, How Vulnerable are denning bears to disturbance?, http://bearproject.info/wp-content/uploads/2014/07/A-26-denning-disturbance.pdf

Long, R. A. et al. 2008. "Fuels Reduction in a Western Coniferous Forest: Effects on Quantity and Quality of Forage for Elk." *Rangeland Ecology and Management.*

McKelvey, K. S. et al. 2011. "Climate change predicted to shift wolverine distributions, connectivity, and dispersal corridors." *Ecological Applications.*

Mildrexler, D.J.,et al, 2020, Large Trees Dominate Carbon Storage in Forests East of the Cascade Crest in the United States, Pacific Northwest: Frontiers in Forests and Global Change, v. 3, p. 1-15, Article 594274

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

Nie, M. et al. 2017. *Fish and Wildlife Management on Federal Lands Debunking State Supremacy.* Missoula: University of Montana.

Proffitt, K. M. et al. 2019. "A century of changing fire management alters ungulate forage in a wildfire-dominated landscape." *Forestry.*

Rapp, V., 2003, New findings about old-growth forests: Pacific Northwest Research Station Science Update, 12 p. https://www.fs.fed.us/pnw/pubs/science-update-4.pdf

Reinhardt, E., and Holsinger, L, 2010, Effects of fuel treatments on carbon-disturbance relationships in forests of the northern Rocky Mountains: Forest Ecology and Management, v. 259, p. 1427–1435.

Schultz, S., 1992, Comments on Draft Environmental Impact Assessment, Amendment 16 to Flathead Forest Plan.

Segerstrom, C., 2018, Timber is Oregon's biggest carbon polluter: High Country News, May 16, 2018.

Squires, J. R. et al. 2019. "Winter recreation and Canada lynx: reducing conflict through niche partitioning." *Ecosphere.*

Stephenson, N.L. et al, 2014, Rate of tree carbon accumulation increases continuously with tree size: Nature, v. 507, p. 90-93, doi:10.1038/nature12914

Stenzel, J.E., et al, 2019, Fixing a snag in carbon emissions estimates from wildfires: Global Change Biology, v. 25, 3985-3994, DOI: 10.1111/gcb.14716..

USDA Forest Service, 1987, Old Growth Habitat Characteristics and Management Guidelines. Kootenai National Forest, Forest Plan Appendix 17. USDA Forest Service Region One

Wales, Barbara C., Lowell H. Suring, Miles A. Hemstrom, 2007. Modeling potential outcomes of fire and fuel management scenarios on the structure of forested habitats in northeast Oregon, USA. Landscape and Urban Planning 80 (2007) 223-236.

Yanishevsky, Rosalind M., 1994. Old-Growth Overview: Fragmented Management of Fragmented Habitat. Pp. 7-36 *in* Rocky Mountain Challenge: Fulfilling a New Mission in the U.S. Forest Service. Association of Forest Service Employees For Environmental Ethics, P.O. Box 11615, Eugene, Oregon 97440, February, 1994.