Below are Jeff Lonn’s comments on the proposed site-specific Forest Plan amendment to Old Growth (OG) standards on the Gold Butterfly project as detailed in the draft SEIS. I oppose the proposed amendment, based on the following reasons in **bold**. Requests for more information are underlined.

**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 SEIS, 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. 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 processes 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 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” (SEIS, 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*”(SEIS, 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”* (SEIS, 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, SEIS 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 SEIS, 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*.” (SEIS, 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”* (SEIS, 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: “*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).

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.

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 provideexisting 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 SEIS, 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”*** (**SEIS, p. 18-19**). The SEIS, 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 SEIS, 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 I 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.

**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 minimums, 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 the new standards 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 17, 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 SEIS. Please develop a third alternative that considers ALL of Green et al’s data, results, and recommendations, and includes more quantifiable criteria than either Green et al or the Forest Plan.

**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 SEIS, 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? I am 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 SEIS 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 SEIS (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, SEIS, 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). 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 provideexisting 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 SEIS, 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 required). 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.”*

**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 ft2/acre, and Fielder et al’s (2007a) recommendations stated: *“Reserve basal areas of 10–18 m2 per hectare (45-**80 ft2/acre) are prescribed for post-treatment stands. Densities at the high end of this range (80 ft2/acre) are retained in stands dominated by large trees*.” None of these other references are included or discussed in the SEIS or the Gold Butterfly FEIS, which speaks to my 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.

It is not clear why the SEIS (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 effects of the old growth amendment on wildlife as compared to 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 SEIS (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 SEIS 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 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; Reinhardt and Holsinger, 2010; Stenzel et al, 2019) have found that logging emits significant atmospheric carbon, much more than wildfires. Please compare estimated carbon emissions and carbon sequestration using Green et al’s standards versus the Forest Plan standards on the Gold Butterfly project.

**Summary:** BNF is already allowed to preserve as much old growth, by any definition, as they want. A solution to BNF’s stated “problems” would be to prohibit commercial logging and road building in old growth using both definitions, Green et al’s and the Forest Plan. The only reason to amend old growth standards is to enable BNF to better get the cut out. If you choose to continue with the proposed amendment, then you must follow NEPA procedures as outlined above.

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