Opportunity to Comment


One hundred ten parties submitted 118 letters within the comment period. One additional letter was submitted after the close of comment period and will not be considered.

The Forest Service assigned a number to each letter and comment, grouped and summarized similar comments, assigned each comment to a category, and prepared responses. Consistent with NEPA implementing regulations 40 CFR §1503.4, response categories include:

- modification of the Proposed Action (page 3),
- consideration of additional alternatives (page 4),
- clarification of the analysis and/or EIS (page 5),
- correction of the analysis and/or EIS (page 16),
- further response not required (page 17), and
- consideration of literature cited (page 76).

The following parties submitted letters during the comment period. Letters are numbered in order of receipt. Entry number 91 is a blank entry and not listed.

1. American Forest Resource Council
2. Theresa Blazicevich
3. Marilyn Sanders
4. Michelle Long
5. Marilyn Long
6. European Wilderness Society
7. Patricia Ames
8. Claudia Narcisco
9. Gail Goheen
10. Michele Dieterich
11. Stephen Goheen
12. Diana Simpson
13. Robert Oset
14. Janice Lee
15. Al Brown
16. Susan Thraen
17. Senator Patrick Connell, Montana State Senate
18. Jim Kalkofen
19. Russ Lawrence
20. Carol and Jim Hansen
21. Dallas Erickson
22. Bill Whealey
23. Eric Nelson
61. Patricia Ames
62. Diane Olhoeft
63. Linda Sherman-Nurick
64. Ryan Bressler
65. Andy Roubik
66. Chuck Anderson
67. Cassie Buhl
68. William Peck, Idaho Forest Group
69. Gail Goheen
70. Sally Blevins
71. Kathryn Tilly
72. Greg Beardslee
73. Larry Campbell
74. Bill LaCroix, Bitterrooters for Planning
75. Marla Fox, WildEarth Guardians
76. Scott Battaion
77. Bill LaCroix
78. Marla Fox, WildEarth Guardians
79. Linda Roszkiewicz
80. Ravalli County Board of Commissioners
81. Jeff Juel, Alliance for the Wild Rockies
82. Kathy Stroppel-Holl
83. Kylie Paul
24. Jamison Starbuck 84. Timothy West
25. Valerie Aerni 85. U.S. Environmental Protection Agency
26. Josh Page 86. Mineral County Commissioners
27. Karen Cowan 87. Mineral County Resource Coalition
28. Peter Reynolds 88. Gary Cuffin
29. John Herbert 89. Laura Jackson
30. Cate Campbell 90. Montana Fish, Wildlife and Parks
31. Dan Brandborg 92. Michele Dieterich
32. Suzanna McDougal 93. Tim Johnson, Corvallis School District
33. Charles Mabbott 94. Samantha O’Byrne
34. Taylor Orr 95. Richard Burrows
35. Jill Davies, Sustainable Living Systems 96. Dyrk Krueger
36. Jeff Lonn 97. Roger De Haan
37. Scott Kuehn, Pyramid Mountain Lumber 98. Jose Selig
38. Ravalli County Collaborative 99. Jim Stubblefield
39. Marilyn Wolff 100. Linda Dwokak
40. Van Keele 101. Michelle Long
41. Karen Savory 102. Eric Kurtz
42. Judy O’Brien Anon 103. Jennifer Knell
43. Yvonne Savory 104. Senator Fred Thomas, Montana State Senate
44. Kathleen Roubik 105. Terri Roeper
45. Gary Milner 106. Robert Roeper
46. Sharon Luibrand 107. Jennifer Scotia
47. Mary Langenderfer 108. Ellen Anon
49. Nathan Luibrand 110. Sarah Roubik
50. Mary Lakes 111. Jim Miller
51. Larry Evans, Western MT Mycological Assoc 112. Carol Blum
52. Mari Laxmi von Hoffman 113. Caitlin Miller
53. Dave Campbell 114. Claudia Narcisco
54. Caleb Senn 115. Marina Weatherly
55. Peter Clarkson 116. Kalon Baughan
56. Jim Parker 117. Stephen and Gail Goheen
57. Jerry Downey 118. Stephen and Gail Goheen
58. Bitterroot Restoration Committee 119. Jeff Lonn
59. Jeff Kern, Bitterroot Backcountry Cyclists
60. Michael Hoyt

Comment source is identified in parentheses at the end of each comment statement. For example, “4-1” indicates letter 4, comment 1. Comment letters with numbering added are available online at: https://cara.ecosystem-management.org/Public/ReadingRoom?project=51486

Comment text is summarized or paraphrased unless enclosed in quotation marks. Responses were only prepared for substantive comments. Substantive comments include: comments that address new scientific information or data that would have a bearing on the analysis; comments that identify errors in the analysis, assumptions, methodology, or conclusions; comments that address misinformation that could affect the outcome of analysis; comments that request clarification; or comments that identify a new alternative with a mix of allocations that differ from those under any of the proposed
actions. Comments that were in general favor or against a proposed action, agree or disagree with Forest Service policy or decisions without justification or supporting information, do not pertain to the project, or that take the form of vague, open-ended questions or statements were not addressed.

Response Category 1. Modify the Proposed Action

**Comment 1a.** We encourage using a method of closure that would allow some future access for fire and management. This could include obliterating the first 300', water bars and seeding. (1-2, 37-2, 68-9, 86-9, 87-7, 119-9)

**Response:** A minimum roads analysis was completed during the early planning stages of this project. The analysis considered roads needed for future management access. The roads analysis document is located in the Project File (PF-ROAD-009).

**Comment 1b.** When a road has line skidding units below the road, the road needs to be closed to the public. It is unsafe and virtually impossible to move a line machine for every vehicle that wants by. Eliminate any "Keep Open" (KO) roads in the contract when there are line units on that system. (37-4)

**Response:** Temporary closures of Forest Service administered roads will be issued by the District Ranger on an as-needed basis where skyline yarding operations are occurring during project implementation.

**Comment 1c.** Consider decommissioning more roads within the project area. (40-24, 78-34)

**Response:** A roads analysis was completed during the early planning stages of this project. The analysis considered roads that could be decommissioned for resources benefits versus needs for future management access. The roads analysis document is located in the Project File (PF-ROAD-009).

**Comment 1d.** Regarding Forest System Road 13111, consider converting the existing road into a single track trail capable of supporting mountain bike and pedestrian use rather than complete obliteration as currently proposed. (54-1, 59-3, 64-7, 66-1, 67-1, 72-1)

**Response:** Road storage (not decommissioning) was originally planned for Forest System Road 13111, this has been corrected in FEIS Appendix F. After reviewing public comment, FSR 13111 will be rehabilitated to allow for single track, non-motorized use and this section will be managed as a National Forest System trail following project implementation. See list of changes from DEIS to FEIS in Chapter 1, Section 1.10.

**Comment 1e.** Modify the proposed action to restrict clear cut areas to 20 acres or less. (89-1, 105-1, 106-1)

**Response:** U.S. Forest Service Region 1 guidance allows for clear cuts up to 40 acres in size without Regional Forester approval. Clear cut size for this project was determined based on the specific silvicultural needs of each respective stand.

**Comment 1f.** Modify the proposed action to restrict clear cut areas to 10 acres or less. (95-2)

**Response:** U.S. Forest Service Region 1 guidance allows for clear cuts up to 40 acres in size without Regional Forester approval. Clear cut size for this project was determined based on the specific silvicultural needs of each respective stand.
Comment 1g. Consider no yarding of wildlife trees design feature extended to non-wildlife trees as well. Additionally, any trees damaged during the logging operations, such as those used to set cables should also be left on site, either standing as snags or as coarse woody debris. (114-11)

Response: We are not certain what is meant by ‘non-wildlife’ trees. Snag and coarse woody debris design features (FEIS Chapter 2, Table 2.2-8) were developed to ensure protections for wildlife habitat and soil productivity.

Response Category 2. Develop Alternatives


Response: Non-commercial thinning in old growth stands was considered but not carried forward as an alternative to analyze as non-commercial thinning would not treat the size class of trees with identified insect and disease concerns in many units. See FEIS Chapter 2, Section 2.3 Alternatives Considered but Eliminated from Detailed Study.

Comment 2b. Develop an alternative that does not cut old growth stands. (3-3, 4-3, 6-3, 14-1, 20-4, 28-10, 29-1, 30-6, 31-1, 32-4, 33-4, 35-5, 36-71, 39-2, 39-8, 40-7, 40-34, 41-1, 41-3, 42-1, 43-3, 45-2, 45-15, 45-22, 47-2, 52-2, 56-5, 61-1, 61-2, 64-1, 70-1, 73-21, 73-22, 73-34, 75-1, 77-2, 81-45, 83-2, 92-3, 92-8, 97-3, 97-5, 100-1, 103-1, 107-1, 108-1, 111-5, 111-6, 112-3, 112-4, 113-3, 115-4, 120-2, 120-3)

Response: Alternative 3 as presented in the FEIS (Chapter 1, Section 1.8.2 Issues Used to Formulate an Alternative) does not propose commercial or non-commercial treatments in old growth.

Comment 2c. Develop an alternative that does not re-open 16.5 miles of undetermined roads. (6-3, 8-2, 10-2, 14-2, 16-1, 19-5, 29-1, 32-1, 35-5, 36-2, 39-2, 39-7, 40-6, 40-9, 40-23, 41-1, 41-7, 42-1, 43-11, 44-1, 45-2, 45-22, 50-5, 56-5, 60-11, 61-7, 64-1, 70-1, 73-34, 74-4, 74-12, 77-2, 83-2, 83-13, 92-4, 92-8, 103-1, 108-2, 111-6, 112-2, 112-4, 114-6, 114-9, 120-2)

Response: Vegetation management in old growth stands and construction of new roads were the two primary issues used to develop an alternative to the proposed action (see FEIS Chapter 1, Section 1.8.2) based on external and internal scoping. See FEIS Chapter 2, Section 2.3 Alternatives Considered but Eliminated from Detailed Study.

Comment 2d. Develop an alternative that provides funding and education for homeowners to conduct fire safe treatments around their property and focuses commercial and non-commercial treatments within the Community Protection Zone. (1-6, 6-3, 73-30, 92-4, 92-6, 92-30, 103-1)

Response: Funding for work on private land is beyond the scope of this project. The Firewise USA program through the National Fire Protection Association or the hazardous fuels reduction program through the Bitterroot Resource Conservation and Development District provide resources for private landowners to reduce wildfire risks on their property. Seventy-six percent of commercial and non-commercial treatments are located within the Wildland-Urban Interface (WUI). The WUI is delineated by the Bitterroot Community Wildfire Protection Plan.

Response: Alternative 3 as presented in the FEIS (Chapter 1, Section 1.8.2 Issues Used to Formulate an Alternative) does not propose new road construction.

Comment 2f. The Bitterroot National Forest should include an alternative with a minimum road system that incorporates restoration aspects. (78-11)

Response: A minimum roads analysis was completed during the early planning stages of this project. The analysis considered roads needed for future management access balances with roads to decommission or store for resource benefits. The roads analysis document is located in the Project File (PF-ROAD-009). Chapter 2 (page 2) of the FEIS lists a series of road improvement measures to be implemented under Alternatives 2 and 3.

Response Category 3. Clarify Analysis / EIS

General Clarification to EIS

Comment 3.01. Ravalli County requests the Forest Service consider the "Ravalli County Natural Resource Policy" in your analysis and decision making process. (80-8)

Response: Many goals of the Forest Management section in the Ravalli County Natural Resource Policy is consistent with the Gold Butterfly Project purpose and need.

Comment 3.02. The DEIS represents the analysis of the no action alternative as addressing cumulative effects. But Alternative 1 also includes "activities such as public firewood gathering, dispersed recreation use, fire protection, and scheduled road maintenance (which) would continue within the project area." The DEIS fails to conduct an adequate analysis of the cumulative effects of those activities on Forest resources and users. (81-14)

Response: A cumulative effects analysis was not conducted for Alternative 1. Under Alternative 1 no proposed actions would take place, thus no direct or indirect effects would occur. Without direct or indirect effects of the proposed action, no cumulative effects would take place. We acknowledge ongoing activities will continue to occur within the project area, however, those activities are independent of the actions proposed in Chapter 2 of the FEIS.

Comment 3.03. The DEIS does not analyze and disclose the impacts of livestock grazing on any resource, although it was happening recently on national forest land and is ongoing on private land. (81-16)

Response: The Gold Creek Allotment is currently vacant and has been since 2008. Recent grazing on USFS lands was not authorized and considered incidental. Grazing on private and state land is on-going but was not considered to contribute towards cumulative effects.

Comment 3.04. The DEIS should include the project area boundary on the map. (81-17)
Gold Butterfly Project

Appendix C

Opportunity to Comment

Response: All treatment units, trailhead modifications, and road management actions are marked on all maps in Appendix B. Analysis boundaries for individual resources are described in Specialist Reports.

Comment 3.05. Include areas on the map relating to management area, fuel conditions, fire risk, past management, old growth, analysis areas for various resources, weed infestations, visual quality objectives, suitable wildlife habitat, past fire, problem culverts or other erosion sites, and watershed boundaries. (36-69, 73-20, 81-19, 81-30)

Response: Old growth areas have been added to maps in Appendix B. Descriptions of areas of concern to specific resources can be found in the respective resource specialist reports in the Project File.

Comment 3.06. The DEIS states, "Travel Planning identified changes in travel management as documented in the MVUM1. These changes (such as the Burnt Fork Trailhead relocation) will be implemented over the next few years as funding is available." Does the Gold Butterfly proposal include all such project area travel management changes in the action alternatives? (81-21)

Response: Correct, all travel management changes covered by the Bitterroot National Forest Travel Management Plan for the Gold Butterfly project area have been included in both Alternative 2 and Alternative 3.

Air Quality

Comment 3a.01. We note the reference to the Missoula Impact Zone in the Air Quality report. We recommend also referencing nearby Clean Air Act nonattainment areas in the Final EIS. (85-5)

Response: The smoke air quality was analyzed at the PM2.5. Missoula is a non-attainment for PM 10 and CO. Missoula is approximately 41 miles to the north and west of the project area. When a prescribed burn is proposed through the MT/ID airshed group if the smoke dispersion is less than good burning may be cancelled. Burning under a southwest wind flow is optimal for smoke dispersion.

Fire and Fuels

Comment 3b.01. Provide supporting scientific evidence for the statement on page 4 of the Fire and Fuels Report, "left untreated, all stands become more susceptible to wildland fire as fuel loads increase." (36-5)

Response: This statement is found on page 7 of the Fire and Fuels Specialist Report (PF-FIRE-001) in reference to the analysis assumption that as a stand of vegetation grows, fuels build up over time unless those fuels are removed (through vegetation management) or consumed by fire.

Comment 3b.02. Provide a citation for the estimated historic fire return interval of 15-35 years for low elevation forests on page 3 of the Fire and Fuels Report. (36-15).

Appendix C  Opportunity to Comment

Gold Butterfly Project


Comment 3b.03. Provide supporting evidence for the statement "Fire has been absent in much of the planning area mainly due to effective fire suppression over the last 100 years" on page 8 of the Fire and Fuels Report. (36-20)

Response: Fire history maps (PF-FIRE-006) and regional fire history spatial data were used to determine spatial and temporal fire data for the project area.

Comment 3b.04. How many people live within the Wildland Urban Interface adjacent to the project area? (101-4)

Response: Landownership including individual addresses for the WUI adjacent to the project area are available through Ravalli County tax records and the Montana Cadastral Mapping Project (http://svc.mt.gov/msl/mtcadastral).

Comment 3b.05. Provide an estimate of fire severity area for the project area between 1990 and 2017 in relation to estimates presented on page 2, Chapter 3 of the DEIS. (114-2)

Response: Burn severity maps are produced when a burned area emergency response (BAER) assessment is conducted. A BAER assessment was not conducted for all fires in the project area. Existing spatial data is available at this site (https://www.fs.usda.gov/detailfull/r1/landmanagement/gis/?cid=stelprd3852570&width=full) or upon request to the U.S. Forest Service.

Fisheries

Comment 3c.01. Please disclose how many sites within riparian areas will experience road work disturbance for newly constructed, temporary, and undetermined roads. Please specify how many culverts will be installed in locations where there presently are none. (81-58)

Response: Under Alternative 2 (maximum program of work that could be carried out), proposed construction of new specified road includes installation of one culvert on a headwater tributary to Eastman creek and another 2 culverts on temporary roads on ephemeral draws in Birch Gulch. Direct effects from these actions are limited to less than 40 feet of disturbance for culvert removals or installation. Disturbed areas would be seeded and mulched to speed revegetation and reduce erosion. (PF-WAT-001 p. 17). Riparian areas would also include road decommissioning and storage, including removal of 9 culverts (3 of which are on fish-bearing streams). These treatments would lead to improved riparian function as vegetation recovered and soils stabilized (PF-WAT-001 p. 2, 16, 17).

Design features described in FEIS Chapter 2, Table 2.2-8 describe mitigation that would reduce risk to the riparian area from road related treatments.

Comment 3c.02. Disclose how the DEIS is consistent with Forest Plan Wildlife and Fish Standard #9, "Fish passage shall be provided where roads cross fisheries streams." Disclose how many fish passage barriers will remain after project implementation. (81-166)
Response: Both of the action alternatives fully comply with Forest Plan standard #9. No new culverts are proposed on fish-bearing streams. The project includes the removal of three culverts on fish-bearing streams currently blocking upstream fish passage (the 969A road over North Fork Willow Creek and the 312 road culverts over Grizzly and Arastra Creeks). There will be fewer fish passage barriers following completion of either of the action alternatives.

Comment 3c.03. What is the baseline used to determine the health of the bull trout population? How much monitoring will occur? (101-6)

Response: Information about bull trout populations and population trends is contained in the Fishery Specialist Report and has be incorporated into the FEIS Chapter 3, Section 3.3 (Page 30-32). There are no historical or baseline population figures for bull trout because no population monitoring was conducted historically. The data referenced above show that bull trout in Willow and Gold Creeks are substantially more abundant currently than compared to sampling in 1990 and 1984, respectively. Bull trout populations in the Burnt Fork were slightly less in 2016 than in 1994.

No project-related monitoring is proposed for bull trout. Bull trout population monitoring will continue intermittently as part of Forest Plan Monitoring and long-term monitoring by the Montana Department of Fish, Wildlife, and Parks. Pacific / Inland Native Fish Biological Opinion monitoring in the Burnt Fork drainage will continue approximately every 5 years.

Hydrology

Comment 3d.01. The Draft EIS does not appear to provide information related to baseline wetland locations or potential impacts associated with project activities. There are some design features that are dependent on distance to wetlands (e.g. page 13 of the Draft EIS). Given these design features, we recommend including wetlands location information in the Final EIS to inform their placement. We also recommend including a design feature in the Final EIS for any wetlands that are identified during the project that are not mapped to be brought to the attention of the hydrology specialist for delineation and application of appropriate buffers. (85-3)

Response: Wetlands are protected by Riparian Habitat Conservation Areas (RHCA’s) as such receive primary management consideration to ensure Montana Streamside Management Zone Laws and INFISH requirements are met. In the Gold Butterfly projects, no vegetation treatments are proposed in the RHCA or wetlands. Wetlands are identified during resource inventories and timber sale layout and are included on sale area maps as avoidance zones and are buffered and flagged on the ground. They include features associated with streams such as linear streamside wetlands, headwater basin wetlands, and isolated wetlands. RHCA boundaries for wetlands are designated and marked on the ground and are protected from equipment by 100’ buffers (DEIS Table 2.2-8 p. 12-13). Unmarked wetlands encountered during implementation require notification of sale administrator (TSA) and protections detailed in Table 2.2-8 would be applied. There is language in the timber sale contract that requires TSA notification of any unmarked wetlands encountered during implementation and for them to be buffered and avoided.

All wetlands are buffered as required by the Streamside Management Zone Law, the Forest Plan and INFISH. (PF-WAT-001 p. 6 and 16)
Streamside linear wetland conditions would be improved and returned to functioning where culverts were removed (storage, decommission and road to trail conversion) and function would be reduced where culverts were installed (3 planned locations on temporary and specified roads).

Additional information was inserted in PF-WAT-001 to clarify this on the above referenced pages.

**Comment 3d.02.** The Water Resources report references the draft 2016 Integrated Report and Clean Water Act 303(d) list. We recommend the Final EIS reference the most up to date EPA-approved document, which is currently the final 2016 Integrated Report. (http://deq.mt.gov/Water/Resources/cwaic/reports) We also recommend that the Final EIS include a map of impaired waterbody segments within, or downstream of, the project area. (85-4)

**Response:** The reference has been updated in the FEIS (Chapter 3, Section 3.2 Road-related Impacts to Water Quality) and the impairment summary crossed checked with the 2016 Final Water Quality Integrated Report. Please refer to general map found in Appendix A of the Integrated Report for location and also to PF-WAT-35 for a map that identifies Willow Creek and Muddy Springs Creek, the two listed streams in the Gold Butterfly project area. Appendix A of the Integrated Report also lists the Bitterroot River from Skalkaho to Eight Mile Creek as impaired for low flow and temperature with the source being irrigation, agriculture and wet weather discharges. Neither Willow Creek nor the Burnt Fork have a direct connection to the Bitterroot River due to irrigation withdrawals and water management at the Lee Metcalf Wildlife Refuge.

**Comment 3d.03.** Provide a detailed accounting of how any sediment calculations using truckloads are quantified. (92-32)

**Response:** Estimates of sediment production for log haul were determined with the WEPP (Water Erosion Prediction Project) software as modified for roads analysis (Elliot and Foltz, 2001). Stream crossings used for log haul in Alternative 2 were modeled at low traffic (existing and post-harvest conditions) and at high traffic levels (during log haul) using WEPP. The estimates are reported in PF-WAT-020 in Table 1 and discussed on pages 5-6. In PF-WAT-001 on page 21-23 sediment estimates from log haul are discussed. The FEIS, Chapter 3, pages 23-25 summarizes sediment model results in Table 3.2-5. PF-WAT-018 discusses sediment estimates for Alternative 3. Less sediment is predicted for Alternative 3 due to a reduced number of log trucks, fewer years for implementation, fewer secondary crossings opened and used and is presented in the table found on page 2 of WAT-018.”

**Comment 3d.04.** The DEIS does not fairly compare sediment delivery impacts of Alternatives 2 and 3. See DEIS at 25-26. The Forest Service compares the low-end estimate of truckloads under Alternative 2 with the high-end estimate of truckloads under Alternative 3 to conclude there would only be 50% more sediment delivery under Alternative 2. But by comparing the mid-range estimates under each alternative, Alternative 2 will deliver more than double the sediment as compared to Alternative 3. (78-24, 92-31)

**Response:** Table 2.4-1 has been clarified in the FEIS. The difference between the two alternatives is during the vegetation management portion of the proposal.

After the BMP’s have been applied and during log haul-project implementation-, Alternative 2 is estimated to result in about a 12% decrease below existing levels in sediment contributed from the streamside portions of FR 364 and 969 due to BMP upgrades. Alternative 3 would have
fewer closed roads opened and used for log haul, is estimated to take 2 years less time to implement (allowing for a quicker return to low traffic levels), have fewer log trucks, and no new specified or temporary roads. The model predicts that Alternative 3 would have a greater sediment decrease during implementation of the vegetation management portion of the proposal and is estimated at 21-30% less than the existing condition. (Chapter 3 FEIS p.23; PF-WAT-001 p. 21-23; PF-WAT-020 p. 1-3, 4-6; PF-WAT-018, PF-WAT-011)

Old Growth

Comment 3e.01. Clarify how the project will fully maintain the structure and composition of old growth stands, and "retain old growth characteristics" as required by the 1987 Bitterroot National Forest Plan. (36-69)

Response: A discussion on proposed activity effects to old growth characteristics is provided in the Wildlife Specialist Report, pages 10-16 (PF-WILD-001).

Comment 3e.02. Disclose how old growth field analysis was conducted inside and outside of treatment areas. (40-26)

Response: Proposed units were field verified by a certified Silviculturist and a Wildlife Biologist. If a unit had characteristics similar to OG standards a stand exam was completed to verify. Areas of old growth outside of proposed treatment units used the best available data from previous stand exams and the wildlife database.

Comment 3e.03. Present percentages and conditions of various stand types relative to historic conditions, aerial extent, spatial distribution and connectivity are key to assessing the functionality of old growth. (73-20)


Comment 3e.04. Clarify if Tables 3.4-1 and 3.4-2 acres and percentages refer to entire 3rd order drainages or to only those portions of 3rd order drainages that fall within the project area. (81-29)

Response: The tables reflect the entire 3rd order drainage.

Comment 3e.05. The DEIS mentions "regional old growth definitions (Green et al. 1992, errata 2005)." Are the Tables 3.4-1 and 3.4-2 percentages based on those criteria, or on the Forest Plan criteria set at Wildlife and Fish Standard 2, which begins, "Stand conditions that qualify as old growth will vary by habitat type and landform. Criteria to consider for identifying old growth include…”? We are also concerned that the DEIS is conflating old growth with "the over-mature tree component, as defined by size class" without providing a specific, quantitative definition of the latter, or the relationship between "over-mature tree component" and old-growth forests. (81-33)

Response: The Bitterroot National Forest follows the regional old growth definitions based on Green et.al 1992 (errata 2005) in determining old growth status.

Comment 3e.06. Were the on-the-ground old growth habitat inventories during the summers of 2016 and 2017 to document the comparison of stands to old growth criteria? (81-34)
Response: Data collected during common stand exam plots were used to determine a stand’s old growth status compared to criteria in Green et al. (1992, errata 2005). See Wildlife Specialist Report (PF-WILD-001, Pages 7)

Comment 3e.07. Were all areas proposed for treatment not classified as old growth field reviewed? If not, what screening procedures were used to assure those areas do not meet old growth criteria? (81-35)

Response: Proposed units were field verified by a certified Silviculturist and a Wildlife Biologist. If a unit had characteristics similar to OG standards a stand exam was completed to verify.

Comment 3e.08. How old is the FIA data the old growth analysis relies upon? How many FIA plots fall within the project area boundary, and how many of those are classified as old growth? (81-36).

Response: The FIA data was used to document estimates of old growth across the Forest and geographic scales, not at the project level.

Silviculture

Comment 3f.01. The scoping document proposed vegetation management units in the IRA and was then removed in the Draft Environmental Impact Statement (DEIS). We request including the units back into the scope of the project or be provided with the science based data supporting removal of these units from the project. (80-4)

Response: The initial proposed action had several non-commercial treatment units inside the Stoney Mountain inventoried roadless area. After receiving public feedback during the project scoping period, these units were dropped from the proposed action (FEIS Chapter 1, page 9).

Soils

Comment 3g.01. Disclose the total surface area of all roads, including undetermined roads, within the project area. Disclose how forest and soil productivity is maintained in the project area when an increasing area is being disturbed or withdrawn from productivity calculations. Disclose how Forest Plan standard II-23 is being met. (73-16)

Response: Soil productivity calculations are discussed in the Soils Specialist Report (PF-SOILS-001, pages 1-3). Forest system roads are not included in the productive land base and therefore not considered in soil disturbance analyses (PF-SOILS-002). Disturbance associated with undetermined roads are included in soil disturbance calculations (PF-SOILS-007). See Forest Plan Consistency checklist in Appendix D (pages D-11 – D-12) for project compliance with Bitterroot National Forest Management Plan.

Comment 3g.02. Clarify how log landings and temporary roads are quantified for activity area detrimental soil disturbance calculations. (81-213)

Response: Log landings are quantified on an estimated acreage basis. Temporary roads are quantified by estimated road length multiplied by a fixed width. Detrimental soil disturbance calculations by unit are available in the Project File (see PF-SOILS-007).
Comment 3g.03. Disclose how the project meets Forest Plan goals, objectives and standards for soil resources related to: (7) Plan and conduct land management activities so that reductions of soil productivity potential caused by detrimental compaction, displacement, puddling, and severe burning are minimized. (8) Plan and conduct land management activities so that soil loss, accelerated surface erosion and mass wasting, caused by these activities will not result in an unacceptable reduction in soil productivity and water quality. (9) Design or modify all management practices as necessary to protect land productivity and maintain land stability. (81-221)


Comment 3g.04. Cite existing studies, if available, that quantifies Bitterroot National Forest changes in soil productivity due to past management activities. (81-224)


Timber

Comment 3h.01. The DEIS states "the timber industry operated at 59% of its processing capacity in 2011 due to a lack of timber supply." Disclose how market forces rather than lack of timber supply have caused the timber industry slump. (36-59)

Response: Both timber supply and demand for forest products, as well as technological advances, will always play a role in the health of the timber industry and dependent communities as discussed in a 2017 case study by Headwaters Economics cited by the commenter. The paper confirms that timber supply from federal lands has been a significant factor. Regardless, Bitterroot National Forest plan management goals require the provision of sawtimber and other wood products.

Comment 3h.02. Disclose how many board feet will be cut from building new roads and separately if 16.5 miles of undetermined roads are re-opened. (45-11)

Response: Timber volume estimates are provided in the Economics Specialist Report (PF-ECON-001, Page 7). Timber volume estimates were generated based on treatment prescription and harvest method (ground-based or skyline yarding).

Comment 3h.03. How will retention of snags that do not present a safety risk be assured? How is safety evaluated? (73-25)

Response: Snags are designated in the timber sale contract to be left, except when safety is compromised. Safety is evaluated based on the snag's proximity to operations and potential for risk if the tree falls or is forcibly impacted. If a snag must be felled for safety reasons, it must be left on site and cannot be removed. With ground-based logging, controlled felling and safety features which protect workers within the cab of equipment minimize risk of snags to personnel; snags are rarely felled for safety in these situations. With skyline logging, snag safety is a larger concern due to loggers working unprotected on the ground, and the larger potential for felled and yarded trees to impact standing snags. In skyline units, snags may be marked in clumps or around
the perimeter of a unit, thus minimizing risk to workers and the need to fall snags for safety reasons. Refer to the snag analysis in the Wildlife Specialist Report (PF-WILD-001, page 18).

### Invasive Plants

**Comment 3i.01.** Clarify that "not quantified" as an indicator of measure meant that no baseline data were established. How will the Forest know that weeds have increased if no baseline was established? Disclose examples of where logging and road building have not increased weeds in a project area. (45-6)

**Response:** A baseline has been established through inventory and what invasive species exist in the project area. See Invasive Plants Specialist Report (PF-INVASIVES-001, pages 1-4) and Bitterroot National Forest Management Plan monitoring reports: https://www.fs.usda.gov/detail/bitterroot/landmanagement/planning/?cid=fseprd490792. Not quantified refers to the fact that the number of plants can vary from one year to the next due to environmental conditions like temperature, timing and amount of precipitation. The Forest Service will determine that there has been an increase in weeds based on follow up inventory.

**Comment 3i.02.** The DEIS does not present any numerical estimates of noxious weeds in the project area, disclose if there is recent on-the-ground survey data. (81-235)

**Response:** Field surveys in the project area were conducted during the summer of 2017 and 2018 by botany field crews for sensitive plants and noxious weeds. Invasive crews also survey known infestations of hawkweed and the eradicated dalmatian toadflax site annually.

### Roads and Transportation

**Comment 3j.01.** Define historic roads, as referenced in the design feature "historic roads will not be widened or narrowed by the project," and disclose their location. (81-59)

**Response:** Historic roads are linear features that have been determined eligible for the National Register of Historic Places (NRHP) under Section 106 of the National Historic Preservation Act of 1966. The USFS manages historic roads, trails, and other linear routes under the heritage program as it manages all other heritage resources, by identifying, evaluating and mitigating for adverse effect (if any). This project will not adversely affect any historic roads. The Gold Creek Road is the only historic road within the project area.

**Comment 3j.02.** Is there a comprehensive database of undetermined roads in the project area? (81-67)

**Response:** Spatial data on undetermined roads are included in the Natural Resource Manager Infrastructure database along with data on all other maintenance level classification roads.

**Comment 3j.03.** The DEIS also states of undetermined roads "Most of these are effectively stored due to Kelly humps and/or vegetation. These will be managed as ML 1 roads." Does this mean those particular roads will be put on the system (implied by ML 1 status)?" (81-68)

**Response:** Maintenance level 1 roads will be included on the U.S. Forest Service road system. FEIS Appendix F includes the specific treatment actions and mileage for each undetermined road that will be stored or decommissioned.
Comment 3j.04. How does project analysis account for all undetermined roads in the project area? (81-69)

Response: Spatial data on undetermined roads are included in the Natural Resource Management transportation database along with data on all other maintenance level classification roads. This database along with on-the-ground survey information is used in project analysis.

Comment 3j.05. "Please disclose on a map ALL of the roads in the project area the FS is aware of, distinguishing between the various Maintenance Levels or Undetermined status, or other non-system status such as County or private. Please disclose closure status on this map." (81-70)

Response: FEIS Appendix A provides the location of all roads in the project area including road closure and maintenance level status.

Comment 3j.06. What is status and timeline of changes to project area forest roads, trails, and over-snow (winter) access authorized under the Bitterroot National Forest Travel Management Planning Project Record of Decision and the forest-wide Travel Analysis Report? (81-76, 81-79)

Response: Relocation of the Burnt Fork and Willow Creek trailheads through implementation of Alternative 2 or Alternative 3 will complete changes to the project needed to be compliant with the Bitterroot National Forest Travel Management Plan.

Comment 3j.07. What type of stabilization will be done (if any) of the rock wall along the lower portion of Willow Creek Road (FS 969) where the rocks sheared off this spring (May 2018)? (82-3)

Response: Forest Service transportation engineers surveyed the rock slide location and determined no further stabilization work is needed at this time.

Wildlife

Comment 3k.01. Clarify why road building and logging units were not dropped from all mapped lynx habitat. (40-42)

Response: The Northern Rockies Lynx Management Direction allows road building and commercial logging in mapped lynx habitat under certain conditions. Proposed units that did not meet the NRLMD Standards and Guidelines were dropped from the proposed action. Units that remain in the proposed action meet NRLMD Standards and Guidelines.

Comment 3k.02. Disclose how Canada lynx environmental baseline was quantified. (81-93)

Response: The process for quantifying the affected environment for lynx is disclosed in the first paragraph of the Lynx subsection in the Wildlife section of the DEIS, and in the Affected Environment sub section of the Canada Lynx section of the Wildlife Specialist’s Report (PF-WILD-001). Affected environment is synonymous with the environmental baseline; both refer to the existing condition. The existing condition for lynx habitat is displayed in Tables 3.5 11 to 13 in the DEIS, and in Tables 3.7 10 to 12 in the Wildlife Specialist’s Report (PF-WILD-001).

Comment 3k.03. Disclose cumulative impacts of recreation on wolverines. (81-98)
Response: The cumulative effects of recreation to wolverines at the Forest scale were disclosed in the FEIS for the Bitterroot National Forest Travel Management Planning Project (USDA Forest Service 2016), which is hereby incorporated by reference.

Comment 3k.04. Clarify why "roads that are closed to full-sized motorized vehicle use all year are counted as closed roads, even though we know that some level of unauthorized OHV use occurs on some of these roads" was used for the elk analysis and not the grizzly bear analysis. (81-103)

Response: The same definition of an open road was used for both analyses. The grizzly bear open road density calculations were further parsed into spring, summer and fall seasons, whereas open road densities used to determine elk habitat effectiveness assumed that a road open to motorized use any time during the year was counted as an open road. This is analogous to the summer season road density calculations for grizzly bear.

Comment 3k.05. Define carrying capacity (for PIWO) and how it relates cumulatively across the Bitterroot National Forest. (81-114)

Response: See the Cumulative Effects heading of the Pileated Woodpecker subsection in the Wildlife section of the DEIS for a discussion of pileated woodpecker habitat and potential numbers of pileated woodpeckers this habitat could support across the Bitterroot drainage. See also the Cumulative Effects subsection of the Pileated Woodpecker section of the Wildlife Specialist’s Report (PF-WILD-001).

Comment 3k.06. What is the percentage of the project area above 6,800 feet in elevation? How much area of proposed treatment is above 6,800 feet in elevation? (81-116)

Response: About 49% of the project area is above 6800'. The area within proposed treatment units above 6800' is about 1,156 acres in Alternative 2, and about 1,007 acres in Alternative 3.

Comment 3k.07. Clarify what is meant by short-term viability in reference to the statement "short-term viability of pileated woodpecker across the Region is not an issue (Samson 2005)." Disclose how Samson's conclusions for the longer term relate to wildlife species. (81-118)

Response: Samson (2005) defined short-term viability as viability in today’s landscape, and evaluated short-term viability using four criteria: distribution and amounts of habitat; human disturbance; biotic interactions; and managing for ecological processes. He concluded that viable populations in the short term for these species (northern goshawk, black-backed woodpecker, flammulated owl, and pileated woodpecker) will be maintained as there is no scientific evidence that the species are decreasing in number, there have been substantial increases in the extent and connectivity of forested habitat since European settlement, the level of timber harvest of the forested landscape in the Northern Region has been insignificant, and well-distributed and abundant habitat exists on today’s landscape for these species.

Samson (2005) concluded that the most urgent issue to provide for the long-term viability of these species is to restore the sustainability of the grassland and forested ecosystems to a condition more like historic (Pre-European), which will require a very aggressive program in vegetation management.
Economic Analysis

**Comment 31.01.** Provide within the economic analysis the additional volume and acres harvested over and above that required for the forest health objective to clarify the "cost" of restoration treatments. (38-2)

**Response:** NEPA does not require a monetary cost-benefit analysis. If an agency prepares an economic cost-benefit analysis, then one must be prepared and displayed for all alternatives [40 CFR 1502.23]. The economic analysis presented in the Economics report (ECON-001) provides a cost-benefit analysis of Alternatives 1, 2, and 3 as described in Chapter 2 of the FEIS. Cost estimates other than those associated with logging operations, such as road improvements, erosion control, and weed treatments, are provided, by alternative, in Table 4 of the Economics report (ECON-001).

**Comment 31.02.** Clarify how the Forest Service specifically quantified how Ravalli County is a "timber-dependent community" and specifically how the Gold Butterfly timber sale is going to benefit our county. Additionally, provide an estimate of the acres and volume harvested, over and above that needed for Objective #1, in order to provide for Objective #2 as related to the 2003 Healthy Forest Restoration Act. (19-2, 38-10, 73-36, 74-7, 77-5)

**Response:** Reference to Ravalli County as a timber-dependent community could not be found in the DEIS and is not included in the FEIS. Page 5 of FEIS Chapter 1 references the National Forest Management Act’s requirement to give consideration to the economic stability of communities whose economies are dependent on National Forest materials. This statement does not imply Ravalli County is a timber-dependent community.

Climate Change

**Comment 5m.01.** The DEIS does not analyze or disclose the body of science implicating logging activities as a contributor to reduced carbon stocks in forests and increases in greenhouse gas emissions. The DEIS fails to provide estimates of the total amount of carbon dioxide or other greenhouse gas emissions caused by Forest Service management actions and policies - forest-wide, regionally, or nationally. (81-175)

**Response:** Estimates of carbon emissions related to log hauling were calculated and included in project file (PF-CLIMATE-002).

Response Category 4. Correction of the Analysis and / or EIS

No comments were submitted requesting corrections to the analysis or EIS.
Response Category 5. No Further Response Required

Addressed in Analysis / EIS

Comment 5a.01. How many miles of roads will be decommissioned or reclaimed at the end of the project? (33-7, 34-3)

Response: Treatment actions and mileage on road segments is listed in Appendix F.

Comment 5a.02. How will the introduction and spread of weeds caused by ground disturbance be mitigated? (34-4)

Response: Design features related to invasive plants can be found in Chapter 2, Table 2.2-8.

Disagreement with Purpose and Need

Comment 5c.01. The project purpose and need should include an additional specific statement that is necessary to reflect the Agency's obligation to provide water for downstream users (17-3).

Response: The Watershed Specialist Report (see PF-WAT-001) analyzed potential project effects on water yield due to treatment activities. Model estimates indicated water yield would be minor to negligible due to total area treated in relation to watershed size for the Willow Creek drainage. In other words, although project activities will contribute towards long term water quality improvements, treatments are not on a scale large enough to result in an appreciable increase in water quantity.

Comment 5c.02. Consider revising the statement of purpose and need to include improving landscape resilience to disturbance by addressing its over-sized road system (78-12).

Response: A roads analysis was completed during the early planning stages of this project to identify the minimum roads system needed to balance resource concerns and future management use. The roads analysis document is located in the Project File (PF-ROAD-009).

Comment 5c.03. The purpose and need seems flawed based on WUI standards as opposed to that in the Community Protection Zone (~400 yards from structures designed to protect structures and lives of land owners and fire fighters) (109-2).


Legal and Regulatory Compliance

Comment 5d.01. The Forest Service has been, and under this project would continue to manage the project area inconsistent with Forest Plan Road System Standards, in violation of NFMA. These include: roads will be maintained to design standards, and roads will be closed to public use if adequate road maintenance funds are not available. The DEIS includes no alternative to bring the FS into compliance with the above standards, and thus violates NEPA (73-14, 81-65).
Gold Butterfly Project

Response: Maintenance occurs on project area roads (see PF-ROAD-012 and PF-ROAD-013 for road maintenance report). Roads are maintained in accordance with their road management objectives (PF-ROAD-010). Project activities include road improvements and BMPs to bring roads up to standards where needed.

Comment 5d.02. The DEIS fails to include a full range of action alternatives, as required by NEPA. The FS must fully analyze a Modified Alternative 3 as introduced above and explained in further detail (81-7).

Response: HFRA Title 1, Section 104 requires development of an action alternative if an alternative is proposed during scoping or the collaborative process and meets the purpose and need of the project. Alternative 3 was developed based on input received during an alternative development workshop (see FEIS Chapter 1, page 8, 10). See FEIS Chapter 2, Section 2.3 Alternatives Considered but Eliminated from Detailed Study.

Comment 5d.03. The DEIS discloses the impacts of not treating old growth units in alternative 3 yet the DEIS recognizes no environmental benefits to not treating old growth. As such it violates NEPA regulations at 40 CFR § 1502.2 (g) (81-8).

Response: 40 CFR § 1502.2 (g) states that “environmental impact statements shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made.” The No Action alternative and Alternative 3 disclose the environmental impacts of not treating old growth in comparison to Alternative 2. For example, the Wildlife Specialist Report discusses proposed action impacts on American marten, a management indicator species for old growth forests, in the context of habitat loss and fragmentation. American marten habitat includes both old growth and other mature forest stands (see Wildlife Specialist Report, PF-WILD-001, pages 85-90).

Comment 5d.04. The DEIS mentions other reports where the analysis appears, but itself the DEIS does not explain how it arrives at many of its determinations and conclusions, nor does it disclose environmental impacts. The DEIS fails to comply with NEPA’s requirements to take a hard look so that the public or a decision maker can understand such impacts (81-10).

Response: The environmental consequences of the FEIS and specialist reports disclose environmental impacts. Chapter 3 focuses specifically on potential significant environmental concerns. Other environmental consequences are disclosed in the project file (see various specialist reports). 40 CFR § 1502.1 directs agencies to focus on significant environmental issues. The FEIS Chapter 3 is structured in this manner.

Comment 5d.05. The DEIS cites few or no results of the monitoring required in the Forest Plan. Also, the Forest Plan Monitoring and Evaluation Reports published are not as frequent and detailed as the Forest Plan requires (81-12).

Response: Monitoring data was cited in specialist reports where data were available and pertinent to the effects analysis. For example, see Fisheries Specialist Report (PF-FISH-002, Affected Environment discussion).

Comment 5d.06. The DEIS fails to include an analysis of how well past projects met the goals, objectives, desired conditions, etc. stated in their respective NEPA documents, how well the projects conformed to forest plan standards and guidelines (81-13).

Response: Analysis of past projects not required. See response to comment 5d.05 regarding specialist reports use of existing monitoring data to analyze existing conditions and impacts.
Comment 5d.07. The DEIS does not demonstrate how it is minimizing the forest-wide road system in compliance with the Travel Management Regulations and related Directives (81-72).

Response: A roads analysis was completed during the early planning stages of this project to identify the minimum roads system needed to balance resource concerns and future management use. The roads analysis document is located in the Project File (PF-ROAD-009).

Comment 5d.08. The DEIS must disclose how this project is consistent with the Bitterroot Forest Plan (78-38).

Response: See FEIS Appendix D for Forest Plan Consistency Checklist.

Project Implementation

Comment 5e.01. Ravalli County is concerned about the impacts to county owned/maintained roads from heavy equipment and logging trucks, mostly, but not limited to, the impacts to Willow Creek Road. Due to resource and financial limitations, Ravalli County would not be able to accommodate the necessary maintenance during the project, nor the rehabilitation of the road after the project is complete. Concerns with the increased traffic associated with the project are: 1) Road impacts/deterioration of both gravel and paved sections of Willow Creek Road, 2) Impacts/solutions to load rating on Willow Creek Bridge, 3) Traffic safety for residents and recreationalists on Willow Creek Road, 4) Health and safety of Corvallis students at the school and utilization of Willow Creek Road for access to and from school and for cross country/track team, 5) Dust emissions from increased traffic. Ravalli County requests a road maintenance agreement and project conditions that would mitigate impacts to the county financially and most importantly to the health, safety and welfare of the citizens (39-5, 41-9, 57-2, 62-8, 76-2, 80-2, 93-1, 94-1).

Response: Potential impacts of log hauling on Willow Creek Road are disclosed in Chapter 3, Section 3.5 Public Health and Safety. See design features in Chapter 2, Table 2.2-8 developed to minimize risks related to log hauling. The Bitterroot National Forest will continue discussions with Ravalli County on road maintenance and repair during and after project implementation to address public concerns to the extent feasible.

Comment 5e.02. The Forest Service should consider limitations on logging truck traffic during bus routes and peak student drop off/pickup times including foot traffic to balance the community's desire to maintain safety while also supporting the logging industry that is crucial to our community in a variety of ways (93-2, 117-14).

Response: Restrictions on log hauling past the Corvallis Elementary School during student drop off and pick up times have been included in project design features, see Public Health and Safety design features in Chapter 2, Table 2.2-8. Log hauling on Willow Creek Road is regulated by State and County highway safety laws and restrictions.

Comment 5e.03. The DEIS fails to adequately address the impact of project implementation on public health and safety, including those related to Willow Creek Road, and any mitigation measures needed to address these issues (117-1).

Response: The potential impacts to public health and safety from log hauling have been disclosed in the FEIS. See Chapter 3, Section 3.5.
Comment 5e.04. The Forest Service should consider multiple contracting opportunities for this project to provide for both large and small companies to have an opportunity to work on this project (96-2).

Response: Due to the size of this project, commercial and non-commercial treatments will be implemented through multiple contracts.

Comment 5e.05. To reduce the number of acres planned for skyline yarding, consider use of ground-based logging systems on slopes greater than 35%. Advances in technology and equipment has reduced environmental concerns and is often less invasive than skyline yarding (1-3).

Response: Forest Plan standards do not allow ground-based yarding on slopes exceeding 40%. See Soils design features in Chapter 2, Table 2.2-8 for yarding on slopes greater than 40%.

Comment 5e.06. Please consider flexibility in operating seasons and conditions. A project of this scale will take a significant amount of time to complete and some units may require winter logging and flexibility may be needed if conditions are not conducive to over snow logging (1-7).

Response: Timber sale contract provisions will allow for flexibility in timing of harvest and log hauling due to weather and road conditions.

Comment 5e.07. Multiple access points to the project area should be considered due to the size of the project and haul miles required to remove logs. Multiple access points would alleviate log hauling impacts on any one access point (57-3).

Response: The Bitterroot National Forest has been and continues to seek additional haul route access options through use of a temporary road use agreement with private landowners.

Comment 5e.08. Implementation of the prescribed improvement cuts on 40% of the acres to be commercially treated lends concerns over "high grading" unless trees are properly marked and monitored (38-7).

Response: Timber sale contract provisions and monitoring by the timber sale administrator ensure compliance on harvest of marked trees.

Comment 5e.09. Any upgrades or maintenance planned for the Willow Creek Road / Bitterroot Irrigation District Bridge must include considerations for ingress and egress to allow residents and road users access during bridge repairs (117-6).

Response: Any maintenance and repair work conducted on portions of Willow Creek Road or the Bitterroot Irrigation District Bridge would be conducted in consultation with and coordinated by Ravalli County and the Montana Department of Transportation.

Air Quality

Comment 5f.01. Prescribed burning will cause air pollution similar to wildfires resulting in health impacts. Consider alternatives to burning, such as chipping and grazing. (2-1)

Response: Approval to implement a prescribed fire project for air quality is vetted through the Montana/Idaho Airshed group. Utilization of biomass by purchasers is encouraged during the harvest operations and prior to burning to minimize emissions.

Comment 5f.02. Heavy use of existing roads, especially Willow Creek Road, will result in air pollution from fine dust and diesel exhaust fumes leading to human health concerns. Comment 3a.02. Provide
citation(s) related to log truck hauling and related dust impacts to human health. (6-12, 92-10, 116-5, 117-12)

**Response:** Potential impacts of log hauling on Willow Creek Road are disclosed in Chapter 3, Section 3.5 Public Health and Safety. See design features in Chapter 2, Table 2.2-8 developed to minimize risks related to log hauling.

**Climate Change**

**Comment 5g.01.** The Carbon and Climate report indicates that the project will reduce CO2 emissions. But literature suggests logging and thinning are big carbon dioxide emitters, more so than wildfire, and that logged forests sequester less carbon than untreated forests. Does this mean the project may exacerbate climate change? (36-27)

**Response:** Pages 5-6 in the Climate Change, Forest Carbon Cycling and Storage Specialist Report (PF-CLIMATE-001) provides the estimated stored carbon levels of the Bitterroot National Forest in the context of stored carbon of all forests in the United States. Carbon release from proposed activities at the Gold Butterfly project scale in comparison to the continental and global scale would be immeasurable.

**Comment 5g.02.** The DEIS discusses carbon cycling and storage, but it does not appear to address how the portion of forest included in the Gold Butterfly Project may change due to an increasingly warming climate. (60-7)

**Response:** The Environmental Consequences section in the Climate Change, Forest Carbon Cycling and Storage Specialist Report (PF-CLIMATE-001) discloses potential changes to forest conditions under the no action alternative and both action alternatives.

**Comment 5g.03.** The Forest Service must consider the cumulative impacts of changes in climate patterns when combined with its proposal to use, construct, reconstruct, and add new roads (both system and temporary) to the landscape. (78-26)

**Response:** Roads are designed and built in accordance to applicable USFS engineering specifications and standards.

**Comment 5g.04.** The DEIS does not provide adequate information of climate change effects on project area vegetation and thus in violation of NEPA. (81-170)

**Response:** See Climate Change, Forest Carbon Cycling and Storage Specialist Report (PF-CLIMATE-001).

**Comment 5g.05.** The DEIS fails to provide an analysis of how realistic or achievable its desired vegetative conditions are in the context of a rapidly changing climate along an unpredictable but changing trajectory. (81-171)

**Response:** The Silviculturist Specialist Report (PF-SILV-001) discloses how management actions are designed to shift existing conditions towards desired conditions.

**Comment 5g.06.** The DEIS fails to disclose how climate change is already influencing forest ecology, except for fisheries and bull trout refugia. This has ramifications as to whether or not the forest in the project area will respond to DEIS assumptions. (81-172)
Response: The Environmental Consequences section of the Climate Change, Forest Carbon Cycling and Storage Specialist Report (PF-CLIMATE-001) discloses potential influences of climate change on forest ecology.

Comment 5g.07. The DEIS does not disclose a cumulative effects analysis to analyze the project's carbon footprint. (81-173)


Comment 5g.08. The Forest Plan does not provide meaningful direction on climate change. (81-174)

Response: Addressing guidance provided in the Bitterroot National Forest Management Plan is beyond the scope of this project.

Comment 5g.09. Best available science suggests that management involving removal of trees and other biomass increased atmospheric carbon dioxide. The DEIS does not address this information. Additionally, the DEIS does not present modeling of forest stands under different management scenarios. The Forest Service should model carbon flux over time for its proposed stand management scenarios and for the various types of vegetation cover found on the Bitterroot National Forest. (81-176)

Response: See Climate Change, Forest Carbon Cycling and Storage Specialist Report (PF-CLIMATE-001). Literature was not provided offering a counter perspective to that provided in the specialist report.

Comment 5g.10. The environmental impacts of logging do not stay with the local community. The environmental impact of the proposed project would be shared around the world. The DEIS should do a more thorough cumulative effects analysis regarding the environmental impact of this project on climate change, appropriate to the overriding need, potentially very long duration and precipitous effects of climate change. (73-3)

Response: Pages 5-6 in the Climate Change, Forest Carbon Cycling and Storage Specialist Report (PF-CLIMATE-001) provides the estimated stored carbon levels of the Bitterroot National Forest in the context of stored carbon of all forests in the United States. Carbon release from proposed activities at the Gold Butterfly project scale in comparison to the continental and global scale would be immeasurable.

Economic Analysis

Comment 5h.01. The DEIS does not present an economic or financial analysis to allow the public to understand how well the post-project system roads will be maintained. Building new roads and rebuilding previous re-vegetated roads is not economically sustainable when existing roads cannot be adequately maintained. (6-23, 26-2, 81-74)

Response: The economic analysis assesses costs, including road maintenance, associated with project implementation. Long term road maintenance not associated with project related use is not assessed. Maintenance level one roads (including older "stored" roads and newly constructed roads) will be stabilized after project use and will not require road maintenance until the next time they are opened for a future project.
Comment 5h.02. The positive economic impacts the project will bring to Ravalli County are speculative. The DEIS should also disclose the negative economic impacts that will result from the project. (36-62)

Response: Potential impacts to the tourism industry in Ravalli County have been addressed in the 'Issues and Concerns' section of the Economic Analysis report (PF-ECON-001).

Comment 5h.03. The DEIS fails to describe and quantify the economic value lost when unlogged forests are logged, including the value of high water quality, clean air, scenery, recreational opportunities, biodiversity, and carbon storage. (36-63, 120-15)

Response: The EIS addresses these resource effects through other quantitative or qualitative means in the respective resource reports. The EIS concludes that effects to these resources are either insignificant or, in the case of water quality, that conditions will actually improve over the long term.

Comment 5h.04. The DEIS does not disclose all costs of the project, including money already spent for mapping, studying the area, and all other administration costs, thus the Forest Service estimate is disingenuous and misleading to the public. (43-8, 92-25)

Response: As stated on page one of the economic analysis, "The cost of planning and environmental analysis is not included because it is considered a committed expense by the time the responsible official makes a decision on whether to implement the proposed action; thus it is not useful for comparing alternatives or for making said decision."

Comment 5h.05. The DEIS should also consider and analyze how the Bitterroot National Forest supplies an outdoor recreation economy that far surpasses the declining timber industry. (78-17)

Response: Potential impacts to the tourism industry in Ravalli County have been addressed in the 'Issues and Concerns' section of the Economic Analysis report (PF-ECON-001).

Comment 5h.06. The DEIS does not provide an economic analysis of obtaining alternative access on other private roads. (81-239)

Response: The DEIS does not formally assess the effects on alternative access routes because none had been formally identified as part of the proposed action or alternatives.

Comment 5h.07. The DEIS does not follow the National Forest Management Act's requirement to give consideration to the economic stability of communities whose economies are dependent on National Forest materials. (81-240)

Response: The economic analysis analyzes the impact to communities associated with the forest products industry, in terms of jobs and labor income contributed by the project.

Comment 5h.08. The DEIS does not account for fire suppression costs. (81-242)

Response: Fire suppression is an ongoing agency cost and is not included as part of the proposed action or alternatives.

Comment 5h.09. The DEIS does not provide an economic analysis. The DEIS must disclose project-related weed treatment, prescribed fire application, NEPA costs, culvert replacement, meadow enhancement. (81-243)

Response: An economic analysis has been completed and is part of the project record (PF-ECON-001), and available to the public on the Bitterroot National Forest website (https://www.fs.usda.gov/project/?project=51486).
**Comment 5h.10.** "For each alternative, please disclose the itemized costs for each of the following: new system roads, new temporary roads (including machine trails and excavated skid trails), project-related road maintenance, road decommissioning, all other road-related work, NEPA and associated pre-decisional costs, sale preparation and administration, project-related weed treatment, prescribed fire application, other project mitigation, post-project monitoring, environmental analyses and reports, public meetings and field trips, publicity, consultation with other government agencies, responding to comments and objections." (81-244)

**Response:** Costs associated with implementation of proposed action and alternatives are analyzed in the economic analysis. Costs associated with planning and environment analysis are not included. As stated on page one of the economic analysis, "The cost of planning and environmental analysis is not included because it is considered a committed expense by the time the responsible official makes a decision on whether to implement the proposed action; thus it is not useful for comparing alternatives or for making said decision."

**Comment 5h.11.** Disclose the funding source for all proposed non-commercial activities. (81-245)

**Response:** Program dollars and timber sale receipts will fund most or all of the non-commercial activities.

**Comment 5h.12.** One of the Forest Management Plan goals is to provide sawtimber and wood products to sustain a viable local economy. Yet the DEIS states that, "due to the size of the product and lack of local mills, this will not increase local timber jobs." Economic benefits leave the county yet local residents are left with the environmental costs. (92-5, 74-8)

**Response:** Comment misquotes the economic analysis. The analysis defines the economic impact zone and analyzes effects to it, including Ravalli County. Environmental cleanup costs are largely paid for the timber sale receipts.

**Comment 5h.13.** Road maintenance throughout the project will be maintained by the contractors and that cost will be subtracted from the timber sale. This issue is twofold. First, the estimate of what it will cost is not part of the principle net value, but the cost will be subtracted from the price of the sale so it will add to the cost of the project. This is not a full disclosure of cost and use of taxpayer dollars. Second, the project will likely be split into five different projects. Which contractor will be responsible for which area of road at what time? (92-23)

**Response:** Present net value is project revenue, minus agency costs. The cost of this work is reflected in the present net value by a corresponding reduction in revenue which occurs when an appraisal allowance is made off the stumpage value of the sale. The economic analysis does not concern which contractors perform work on which roads, it concerns how much the work costs.

**Comment 5h.14.** The economic analysis should include an economic feasibility study of no new road construction or reconstruction. (92-26, 92-27)

**Response:** Alternative 3 as presented in FEIS Chapter 2 proposes no new road construction. The Economic Specialist Report analyzed Alternative 3 with no new road construction (see PF-ECON-001, page 8).

**Comment 5h.15.** The DEIS states that the "timber industry operated at 59% of its processing capacity in 2011 due to a lack of timber supply (McIver et al, 2013)". Other findings suggest market forces rather than lack of timber supply have caused a timber industry slump. (120-13)
Response: Timber supply is also a market force. Both timber supply and demand for forest products, as well as technological advances, have played a role in the health of the timber industry and dependent communities. Regardless, Bitterroot National Forest plan management goals require the provision of sawtimber and other wood products.

Comment 5h.16. Do the principle net value calculations include costs of post-project restoration, reclamation, monitoring, and maintenance? (120-17)

Response: The present net value calculation includes maintenance, restoration, and monitoring costs associated with project activities.

Comment 5h.17. Clarify the statement "There are no unavoidable adverse effects to the economic impact area." under the Unavoidable Adverse Effects section of the DEIS. Reducing the scope of the project would reduce the amount of log truck traffic thereby lessening the economic impact of degraded road conditions on Willow Creek Road (60-12, 60-13)

Response: This statement could not be found within the environmental document.

Fire and Fuels

Comment 5i.01. Smoke generated by prescribed fire is the same as smoke generated by wildland fires, both cause air pollution that affects human health. (2-1)

Response: Approval to implement a prescribed fire project for air quality is vetted through the Montana/Idaho Airshed group. Utilization of biomass by purchasers is encouraged during the harvest operations and prior to burning to minimize emissions.

Comment 5i.02. Fuels treatment in the Wildland Urban Interface should be a priority. Coordinating fuels reduction on public and private land will provide the greatest fire hazard reduction benefit. (19-8)

Response: The majority of the project is in the Wildland Urban Interface as defined by the Ravalli County CWPP. In addition to the WUI the majority of the project area was identified by the CWPP as a High Priority Area for treatment.

Comment 5i.03. I support emphasis on thinning in the WUI but it should not extend out beyond a mile or so. Fire science [Jack Cohen et al] has shown the forest outside of that zone are not threats to homes. (30-4)

Response: The Gold Butterfly project proposes to treat fuels in the wildland-urban interface in an effort to modify fire behavior. Fire starts will continue to occur across the landscape. The ID Team is aware of Dr. Cohen's research and has utilized it during the development of this project.

Comment 5i.04. The act of burning wood is an inefficient process as water molecules absorb a large amount of energy by combustion and water and carbon dioxide enter the atmosphere. (51-5)

Response: Fuel moisture has to be driven off through the evaporation process. Through radiant, and convection heating the fuel particle reaches a specific temperature to ignite and sustain combustion.

Comment 5i.05. The DEIS states that this project will reduce the impact of fires by removing fuels (logging). Studies, including some performed by the Forest Service, indicate that removing combustible materials from a forest may alter the behavior of a naturally occurring fire but it will not eliminate it.
Removing only a portion of the flammable materials will not eliminate the possibility of fire. However, this action will upset the current ecological balance of the forest. (60-3)

**Response:** the Forest Service agrees by reducing the fuels may alter the fire behavior allowing for less severe fires. The fuel loading within the Gold Butterfly area would continue to increase under a no treatment, full suppression strategy. This would lead to large areas of heavy fuel loadings and increase the potential for large fires to develop. Stands would move toward a greater portion of shade tolerant species, which are not adapted to fire. In areas where there has been fuel reductions fire fighters can safely direct attack full suppression fires.

**Comment 5i.06.** The DEIS is not factually designed to decrease fire risk to private property, but instead may literally inflame them. Science states the only true fireproofing of property located within the WUI is achieved by responsible vegetation management within a hundred feet of property backed by responsible local planning and zoning coupled with encouragement and well-defined guidelines from the Forest Service. (74-2)

**Response:** The Firewise program is active in Ravalli County and works to provide information to interested landowners. Proposed treatments under Alternatives would complement treatments proposed and currently occurring on private lands. While individual home-by-home treatments can help reduce the potential loss of individual homes, relying solely on such treatments would forego strategic management opportunities in the wildland urban interface. Though reducing fire behavior adjacent to the National Forest boundary enhances fire management options, protecting private lands and facilities is not part of the purpose and need for this project. This project proposal restores the natural fire return interval and as a byproduct of this treatment provides additional protection to private lands from wildfires. The Forest Service does not protect private land or facilities; that is the individual landowner's responsibility. However, community programs such as Bitterroot RC&D Fuels Grant Programs, and fuel treatments on State and National Forest may lessen fire effects on private lands. The Forest Service encourages residents in the wildland urban interface to reduce the risk to wildfire damage by creating defensible space around their homes and following Firewise protocols.

**Comment 5i.07.** Current science refutes the need for active management to achieve healthy forests. For example, best available science indicates that weather and climate change patterns will determine potential fire severity, regardless of whether a landscape has been logged. (78-14)

**Response:** Weather is an important factor in calculating fire spread and is a required input for fire modeling. Specific information regarding the Behave Plus Modeling as well as results of model runs are contained in the Project File. Fire behavior is determined by fuels, weather and topography. The Gold Butterfly project cannot alter weather or topography but can influence fuel conditions that exist on the landscape. Fuel treatments will alter the fuels within the project area and will trend the area toward the desired conditions.

**Comment 5i.08.** Science shows that forest roads and trails play a role in affecting wildfire occurrence. The Forest Service should consider how forest roads and trails - especially the roads it proposes to add to the official road system - are likely to increase the risk of human-caused wildfires in the project area. (78-29)

**Response:** Neither Alternative 2 or Alternative 3 would increase miles of roads open to the motorized travel by the public year-round or seasonally over what currently exists in the project area (see FEIS Chapter 2, Table 2.2-7).
Comment 5i.09. The DEIS states, "the buildup of fuels allowed by fire suppression suggests that if a fire occurs in the area now it could be uncharacteristically severe in size and intensity." Given that many areas of the BNF have burned in recent years, please provide documentation where those recent fires burned "uncharacteristically severe in size and intensity." (81-177)

Response: The statement was made in describing years of fire suppression within the project area that may have allowed some stands to mature to old growth status that would not have done so under historic fire frequencies. Current fuel conditions may result in a fire that would remove some stands from old growth status.

Comment 5i.10. The BNF has never adequately analyzed and disclosed the forest-wide impacts of its current policy of all-out fire suppression, and DEIS does not indicate that management of wildland fire in the project area will be different following project implementation. (81-178)

Response: Analysis of forest-wide fire suppression policy is beyond the scope of this project.

Comment 5i.11. "Continuing direction for this wildfire suppression on the BNF comes from the Forest Plan, which contains the fire policy. The DEIS's Alternative 1 is the "no action" alternative required under NEPA, and fire suppression is anticipated to be reasonably foreseeable. Fire suppression doesn't imply "no action", but may be included in Alternative 1 if those actions' environmental impacts have been analyzed and disclosed at the programmatic level, such as in the Forest Plan EIS. The problem with this situation is the scale of ecological damage caused by the wide-scale fire suppression program that began almost 100 years ago wasn't recognized until after the Forest Plan was adopted in 1987. It constitutes significant new information that did not result in any new forest plan decisions or direction, which itself may be adopted properly only as an amendment or revision of the Forest Plan, following proper NEPA procedures." (81-179)

Response: Analysis of forest-wide fire suppression policy is beyond the scope of this project.

Comment 5i.12. "The Forest Plan EIS itself did not contemplate a range of possible fire planning scenarios, there were no differences under each alternative it analyzed. Nor did the Forest Plan EIS present anything like a best available science discussion weighing the ecological and financial costs and benefits of wildland fire." (81-180)

Response: Analysis of forest-wide fire suppression policy is beyond the scope of this project.

Comment 5i.13. The DEIS does not provide a discussion of the varying amounts and levels of effectiveness of fuel changes attributable to: varying ages of the past cuts, forest types, and slash treatments. This is true for land of other ownerships also. The DEIS does not disclose how the vegetation patterns that have resulted from past logging and other management actions would influence future fire behavior. (81-181)

Response: Current vegetation patterns as a result of past vegetation management practices are reflected in the fire behavior modeling conducted for the No Action Alternative (see PF-FIRE-006).

Comment 5i.14. The majority of acres burn under weather conditions that make control impossible, and that result in fires burning through treated areas as well as untreated. The DEIS does not recognize the temporal gradients in vegetative recovery following treatments, which are the natural processes acting to regrow the components of natural vegetation. The DEIS uses the term "uncharacteristic wildfire" however it provides no definition for how wildland fire can be measured to be "uncharacteristic." (81-182)
Response: The FEIS uses the term uncharacteristic to describe fire severity in size and frequency in comparison to what historically occurred in the habitat type (i.e. a potentially high severity fire in a habitat type historically characterized by low intensity, high frequency fires).

Comment 5i.15. The premise that thinning and other mechanical treatments replicate natural fire is contradicted by science (for example see Rhodes and Baker 2008, McRae et al 2001, and Rhodes 2007). (81-183)

Response: McRae research is the Canadian boreal forest and outside the project area, Rhodes 08 talks about if a fire were to start in a treated area.

Comment 5i.16. The DEIS does not disclose the actions being taken to reduce fuels on private lands adjacent to the project area, and how those activities (or lack of) will impact the efficacy of the activities proposed for this project. (81-185)

Response: Effects for the analysis was considered if a fire burned from private onto public land.

Comment 5i.17. The DEIS fails to provide a full and detailed accounting of the costs and inherent uncertainties of perpetual fire suppression under Forest Service management. (81-186, 81-187)

Response: Analysis of fire suppression costs and management is beyond the scope of this project.

Comment 5i.18. The Forest Service has not conducted a forest-wide cumulative effects analysis of fire suppression policies nor has it conducted Endangered Species Act consultation of its forest-wide fire management plan. (81-188)

Response: Analysis of forest-wide fire suppression policy is beyond the scope of this project.

Comment 5i.19. The DEIS does not provide scientific support for its claims that the disturbance regime has been altered to the degree that proposed actions are justified. (81-189)

Response: The project area looked at the fire regime and the fire disturbance. See Fire Specialist Report (PF-FIRE-001).

Comment 5i.20. Clearcuts, especially if they do not also include prescribed burning, create a higher likelihood of more hazardous and high-severity fire than otherwise. (83-8, 110-4)

Response: We agree with this statement, treating the fuels will reduce the likelihood of a severe wildfire. Reducing the non-fire tolerant species and allowing for ponderosa pine and maintaining the fire cycle will maintain.

Comment 5i.21. The purpose and need of the project is to "improve landscape resilience to disturbances such as …… and fire", but the process of commercial thinning goes against the best available science. Current scientific studies refute the idea that thinning will reduce the chance and spread of wildfires (see Bradley et al 2016). Studies by the University of Montana demonstrate the interactive effects of historical logging and fire exclusion on ponderosa pine structure in the Northern Rockies actually contributes to severe wildfires. The DEIS does not adequately address this issue. (92-2, 117-15)

Response: Timber harvest and other thinning reduce the fuel loads that surface fire can travel through and get into the tree canopies and under the right conditions initiate a crown fire. Thinning increases the distance between live crowns, if a fire were to occur the fire could drop out of the crowns back to a surface fire. Subsequent treatments using prescribed would keep fuels from accumulating beyond the fire regime condition class one.
Comment 5i.22. The DEIS claims that the proposed treatments will result in predictable wildland fire effects. This is refuted by Rhodes and Baker (2008). (81-195)

Response: This research was based on the simple conceptual framework that unless fire occurs while fuels are reduced the fuels treatments cannot affect fire severity. Subsequent treatments using prescribed would keep fuels from accumulating beyond the fire regime condition class one.

Fisheries

Comment 5j.01. How will the increase of sediment in Willow Creek will impact the Bitterroot River, a world class fishing destination? (41-8)

Response: The DEIS described the spatial extent of measurable sediment increases as a result of the action alternatives. In Chapter 3, “Spatial Scale,” the DEIS described the downstream extent of measurable sediment as the mouth of Stuart Creek, which is far above the Bitterroot River. Furthermore, as described in the Fishery Specialist Report, Willow Creek has no direct surface connection to the Bitterroot River. Instead shortly below Stuart Creek, Willow Creek is diverted into the BRID irrigation system.

Comment 5j.02. The DEIS does not demonstrate consistency with Forest Plan water, air, and soil standard 1. (81-169)

Response: Forest plan consistency is discussed as follows:

- Water quality is maintained and improved in the Burnt Fork municipal watershed (DEIS Chapter 3. P. 9-11; PF-WAT-001 p. 16, 18, 26; PF-WAT-020 p.3, 6-7).
- Soil productivity, water quality and quantity maintained (DEIS Chapter 3 p. 8-12; PF-WAT-001 p. 17-29, PF-WAT-020, PF-WAT-018, PF-SOILS-001).
- Riparian areas are managed to prevent adverse effects to riparian dependent species (DEIS Table 2.2-8; PF-WAT-001 p. 15, 19, 22).
- ECA is used to evaluate cumulative effects. Regeneration harvest comprise a small percentage of the proposed vegetation management treatments (PF-WAT-8).
- Soil and water conservation practices are part of project design (DEIS p. VI, Chapter 2, Table 2.2-8; Chapter 3 p. 8, 11; PF- WAT- 001 p. 3-4).
- Sediment will be reduced from forest roads (DEIS p. VI, 8-12; PF-WAT-001 p. 2, 15-16, 17, 21-26, 28-29; PF-WAT-020. PF-020).

Comment 5j.03. Explain how this project will have a negative effect on bull trout, but fire would be worse given the study Sestrich et al 2011 sited in the fisheries specialist report actually speaks of the benefits of fire to fisheries due to the creation of woody debris (log jams) in the rivers creating new structures and habitat for fish. (92-21)

Response: The DEIS did not state that fire would be worse than the effects (sediment) generated by the action alternatives. The DEIS stated (Chapter 3, page 18) that the combination of sediment inputs generated by roads with and the potentially large sediment increases following a stand-replacing fire could significantly affect bull and westslope cutthroat trout, generating adverse cumulative effects.
Gold Butterfly Project

Appendix C

Opportunity to Comment

Forest Plan Amendment

**Comment 5k.01.** Disclose how Forest Plan amendments meet NEPA requirements, specifically how they result in no cumulative impacts (36-70).

**Response:** See Appendix D for discussion on impacts of FP amendment.

**Comment 5k.02.** The DEIS fails to determine if proposed forest plan amendments are significant, and explain potential impact on any species of concern. Additionally, the DEIS fails to apply the requirements of the 2012 planning rules that are implicated by each forest plan variance it seeks. It fails to consider the best available science and explain any relevant monitoring data (existing or collected to assess this project). And the DEIS fails to address whether the Bitterroot National Forest has identified species of conservation concern (78-40, 81-230, 92-36).

**Response:** Forest plan amendment at the project level were determined not to be significant. See Appendix D (Plan Amendment and Consistency Discussion) in the Final EIS for discussion on Forest Plan amendment compliance with the 2012 planning rule.

**Comment 5k.03.** The DEIS does not provide an assessment identifying best available science on elk / management indicator species issues (81-232).

**Response:** Potential project impacts to elk are discussed in the Wildlife Specialist Report, see PF-WILD-001, pages 83 – 96.

Hydrology

**Comment 5l.01.** Log hauling along Willow Creek Road and road construction within this watershed will contribute sediment to Willow Creek, which is already listed as impaired on the 303(d) list by the Montana Department of Environmental Quality. (6-13, 71-1, 73-12)

**Response:** Water quality status of project area streams is discussed in the FEIS Chapter 3 (page 16). It is disclosed that Willow Creek is an impaired stream due to sediment from near-stream segments of FR 364 and 969. See also page 3 of the Watershed Specialist Report (PF-WAT-001) to find discussion on existing water quality for Willow Creek.

The risk of sediment contributions to Willow Creek from proposed project implementation is discussed in the FEIS on page 23-26. Also on page III, chronic sediment source improvement is identified as a Purpose and Need for the project and included in project proposals are plans to apply Best Management Practices (BMP’s) and design feature to near-stream roads to reduce sediment contributions both during and following project implementation. These BMP’s include stabilizing ditches, reducing flow velocity and volume of road surface and adjacent ditches, draining flow that does occur off to vegetated filter areas where possible, and by armoring the road with an aggregate surface (gravel) in specific areas to reduce rutting and make the road surface more durable (PF-WAT-020). See the FEIS p. VI, in Chapter 2 page 12 and 13, 10-12, and the Watershed Specialist Report, PF-WAT-001 on pages 15, 16, 21-23 and 25-26, on page 1-3 of PF-WAT-20 for discussion.

Action alternatives are consistent with Forest Plan direction, policy, regulation and law concerning water resources (PF-WAT-001 p. 2). The watershed analysis is based upon the inclusion of design features and application of BMP’s (PF-WAT-029, WAT-030, WAT-031).
Activities are included in proposed alternatives that meet BMP standards, move towards TMDL/Watershed Improvement Plan goals and fulfill USFS water quality obligations to the State of Montana (PF-WAT-001 p. 4).

**Comment 5l.02.** Water quality monitoring, specifically for Willow Creek but if possible all project area streams, should be implemented before and after treatment to establish baselines for sediment loads, dissolved solids, temperature, and volume. (19-1)

**Response:** The methodology used to evaluate effects for the Gold Butterfly project is described on pages 12-13 of the Watershed Specialist Report (PF-WAT-001 and PF-WAT-020).

Beginning in 2002, forest monitoring has focused on implementation and effectiveness monitoring and reported findings in Forest Plan monitoring reports Items 17, 19 and 22 (See Forest Plan Monitoring Reports 2002-2015). Identification of sediment sources allows the forest to prescribe treatments to reduce sediment sources and improve water quality.

During the time period 1987-2001 the forest monitored sediment loads and streamflows annually at up to 13 different sites. This type of monitoring was time consuming and provided little to inform decisions as sediment volumes are so dependent upon spring runoff (greater streamflows equal greater sediment yields), snowpack, weather patterns during snowmelt runoff and requires multiple sites visits per day to accurately access sediment transport. In George W. Brown’s Forestry and Water Quality (1989) he discusses the difficulty of measuring sediment due to the variability in sediment transport. Instead, the Forest relies upon published literature that does conduct research level reviews of effectiveness to evaluate effectiveness of treatments on national forest land to help inform decisions related to changes in stream water quality. Computer models are used to estimate changes and provide for comparison of alternatives.

Forest fisheries biologists have been working with MT Fish, Wildlife & Parks biologists since 1993 to collect temperature data on streams in the Bitterroot River basin and monitor an average of 90 sites per year. Data is presented in forest plan monitoring reports, the most recent is for the years 2014-2015 and is available on the BNF web page: https://www.fs.usda.gov/detail/bitterroot/landmanagement/planning/?cid=fseprd490792

**Comment 5l.03.** More roads created as a result of proposed activities and lack of continued road maintenance will result in higher sediment levels in streams and higher water temperatures and modify riparian habitat. (19-4, 22-2, 34-2, 35-2, 47-1, 49-1, 58-2, 61-5, 70-2, 78-6, 79-2, 109-6, 110-2, 116-4, 116-5)

**Response:** The effect of roads on streams in the Gold Butterfly project area is discussed in Chapter 3 of the DEIS on pages 6-12 and also in the Watershed Specialist Report (PF-WAT-001, p.15-17 and PF-WAT-20). New road construction (temporary and specified) would occur mostly outside of sediment contributing areas and Riparian Habitat Conservation Areas (RHCA) with one intermittent stream crossing constructed on a tributary to Willow Creek and two temporary crossings on ephemeral draws in Birch Creek. Design features, BMP improvements and operational guidelines are expected to reduce erosion and sedimentation at most sites from roads during and following timber harvest (DEIS Table 2.2-8. DEIS Chapter 3 p.12, p. 2, 15-29 of PF-WAT-001, PF-WAT-020).

Roads proposed under Alternative 2 are located on the mid- to upper slopes and were designed to have limited contact with water (PF-WAT-001 p. 17). Riparian buffers and limited (3 new
crossings described in above paragraph) proposed activity in the RHCA would maintain riparian habitat and water temperatures (FEIS Chapter 3 p. 8, 9; PF-WAT-001 p. 17, 23-25, 26, 27-29; PF-WAT-020).

Results depend upon implementing BMP’s prior to log haul, maintenance, and restricting log haul during wet periods (FEIS Table 2.2-8 p.12, PF-WAT-001 p. 24, PF-WAT-20 p. 2).

**Comment 51.04.** The ability of the forest and soils to hold water and not generate sediment in streams is an important issue for downstream users who depend on water for irrigation. (28-2)

**Response:** Refer to FEIS Chapter 3, pages 23-26 for the sediment discussion. Analysis indicates that the BMP upgrades on open roads used for log haul would decrease sediment contributions slightly from the existing level during log hauling and by about 50% after hauling is completed (DEIS Table 3.3-3, PF-WAT-020, WAT-001 pages3-4, 15-24). On roads currently closed but opened for log haul sediment contributions would increase above the current level from log haul but decrease after hauling was completed and vegetation recovered (FEIS Table 3.2-5, PF-WAT-001 p. 22-23, PF-WAT-020 p. 6).

Proposed vegetation management actions are likely to increase soil moisture within harvest and burn units due to reduction of transpiring vegetation. This will generally benefit remaining vegetation within and adjacent to the treated areas as lack of soil moisture limits growth and vigor (PF-WAT-001). Potential water yield effects were analyzed on pages 18-20 in PF-WAT-001, in summary water yield increases from proposed treatments are expected to be minor and not alter downstream channel stability or beneficial uses.

**Comment 51.05.** Sediment leaving the hillsides represents a loss of groundwater storage capacity, soil productivity, and road compaction reduces infiltration of rain and snowmelt. What is the volume of ground water normally intercepted by roads in the project area? What is the total road surface area that inhibits infiltration of snowmelt and precipitation? Accounting for elevational differences in precipitation, what is the volume of water effected? Accounting for the slope and soil characteristics, what is the advance in timing of runoff? (73-15, 6-8)

**Response:** Water yield from proposed activities is discussed on pages 18-20 of PF-WAT 001 and supported by analysis in PF-WAT-008. In summary equivalent clearcut area (a measure of potential water yield increase) is expected to remain below thresholds in all hydrologic units except in Birch Gulch where a very small portion of the watershed is national forest land and would receive treatment.

Roads occupy only a small percentage of watershed area, minimizing water yield effects from this source. Willow Creek, with the greatest road density of the project area watershed has less than 2% of its area in roads. Harr et al. (1975), reports that “peak flows were increased significantly after road building, but only when roads occupied at least 12% of the watershed. Roads had no detectable effect on volumes of storm hydrographs.” This study was conducted in the Pacific Northwest where annual precipitation approached 100 inches/year; precipitation in the Gold Butterfly project area is considerably lower with the treatment zone receiving between 14 and 27 inches/year (PFWAT-001 p. 19). It is unlikely that the flow regime would be affected by cumulative road surface area (PF-WAT-001 and WAT-008).

See also the discussion of potential erosion and sediment contributions from harvest units found on page 15-17 of PF-WAT-001. In summary, design features, INFISH buffers, BMP’s combine
to reduce risk of erosion in harvest units and contribution of that downstream. This conclusion is supported by modeling and monitoring (PF-WAT-012).

**Comment 5l.06.** Sediment would increase exponentially from secondary crossings under Alternative 2, resulting in significant impacts to bull trout and cutthroat trout. (78-23)

**Response:** Sediment contributions from log haul is discussed in FEIS Chapter 3 pages 23-26 and PF-WAT-001 page 21-23. Sediment is expected to increase at seventeen secondary crossings above the existing level of essentially 0 even with BMP’s applied, because these crossings are currently closed, vegetated, and not used by motorized vehicles (producing virtually no sediment). As a result, the sediment model predicted the sum of sediment contributions from the seventeen crossings to contribute more than crossings immediately adjacent to Willow Creek that would be used for the life of the project. For the secondary crossings his amount is estimated at about 17 pounds/crossing (PF-WAT-020). The use of individual secondary crossings would be spread out over the entire period of implementation with crossings in one area of the project open, used, restored, and closed before moving onto a different project area with a different set of crossings opened, used, and closed. This would reduce the peak sediment contributions below what is predicted with the WEPP model and displayed in Table 3.3-3 of the DEIS, spreading contributions out over several years rather than all in one year (PF-WAT-020 p. 3).

The project fisheries biologist predicts that although both alternatives contribute sediment to Willow Creek, neither is expected to contribute an amount that would result in measurable population level effects to either bull trout or cutthroat trout. Effects would be moderated by timing of delivery, portion of habitat affected, and inherent population resilience.

Both alternatives would result in overall net decrease in sediment to Willow Creek from the road system following completion of activities due to BMP upgrades on roads. The amount of time to achieve this benefit would be longer with Alternative 2 than 3.

**Comment 5l.07.** The DEIS analysis and proposed road activities fail to ensure the project will comply with the Clean Water Act. Reliance on BMPs is insufficient, especially given the recent road failure and acute sediment loading into Willow Creek, a water quality-limited water body. (78-46)

**Response:** Willow Creek and Muddy Springs Creek (a tributary to Gold Creek) are both listed as impaired for sediment (Chapter 3 FEIS p. 16; PF-WAT-001 p. 6). A Memorandum of Understanding (MOU) between the Forest Service and the State of Montana DEQ requires the Forest Service to apply pertinent BMPs to support the MDEQ B-1 water quality standards during forestry operations. BMPs are the foundation for controlling nonpoint sources of surface water pollution. The end goal is to prevent or reduce sediment-carrying flow originating in areas disturbed by forestry activities from reaching stream, wetlands or other water bodies. The Forest Service has agreed to follow BMPs in the MOU and BMPs are identified during planning and applied during as design features. In the MOU, the USFS commits to restoring impaired waters, meeting Clean Water Act goals and implementing its non-point source strategy (PF-WAT-027), in this project that is accomplished by BMP application, road storage and decommission. Implementation and effectiveness monitoring is routinely conducted during project implementation. The 2016 streamside management zone audits found BMP application on Federal lands was rated as 96% compliant and 98% effective (PF-WAT-001 p. 10-12). See also the design features under the Water Quality and Fisheries heading in Table 2.2-8 in the FEIS and the list of BMP upgrades planned for system roads on page 16 of PF-WAT-001. This list
includes 321 drain dips constructed on roads to get water off the roads in more frequent intervals reducing the risk of future road failures such as occurred in 2017.

The watershed analysis concluded that application of the BMPs would result in a decrease in sediment contributions from near stream portions and primary stream crossings of FR 364 and 969. Sediment contributions would increase on secondary crossings as these areas currently closed and sediment contributions are near 0 (Chapter 3 DEIS p. 10-12; PF-WAT-001 p. 3-4, 15-16, 21-23; PF-WAT-018 p. 1-6; PF-WAT-011) and would move towards the goal identified in the TMDL for reduction of sediment from forest roads.


Comment 51.08. The DEIS takes the position that there's basically only one source of water quality degradation in the project area, which would be fixed by the action alternatives: "The primary source of sedimentation in the project area is in the lower FS section of Willow Creek, where NFSR (National Forest System Road) 364 parallels the creek for several miles. In some locations, road drainage is not functioning properly and sediment is being delivered into the stream." As the DEIS explains, "Poor road drainage increases the risk of catastrophic road failure during high precipitation and runoff events. Risk of failure due to poor road drainage …although not directly adjacent to a stream, could wash downslope, as occurred in the spring of 2017." Note that this describes two separate issues: currently identifiable (on the ground) sediment sources to streams, and the risk of undiscovered (or not yet occurring) sediment sources, such was the case with the Spring 2017 landslide caused by the Willow Creek Road #969. (81-57)

Response: While the main concern for the watershed resource is from log haul on FR 364 and 969 (PF-WAT-001 p. 25) there are other areas that are proposed to be improved to protect water quality. The proposed road improvement package includes more than just work on the near stream sections of FR 364 and 969 and would be implemented with either action alternative. In the FEIS Chapter 2 (pages 9-11), the summary of Alternative 2 and 3 actions include application of BMPs on haul road as part of the timber sale to reduce potential sediment runoff and improve water quality. On page 7 of PF-TRANS-001, discussion of road improvement is presented. Not only are BMPs applied on FR 364 and 696 but the proposed improvements include road decommission and storage, road drainage improvements, riprap of erosive catch basins, sediment traps and aggregate placement where it would provide the most protection. In PF-WAT-001 on page 16 is a summary of BMP upgrades that include rock lined ditches to reduce erosion and capture sediment, drivable dips to get water off the road at frequent intervals, reconditioning of native surface roads to improve drainage (PF-WAT-001 p. 12-16). Decommissioning and storage is discussed in the FEIS Chapter 3 p. 20 and on page 16, 23-25 of PF-WAT-001. These improvements reduce the risk of failures such as occurred in 2017.

The completion of the BMP improvements prior to log haul and maintenance of them is critical to control sediment for the proposed project (PF-WAT-001 p. 26-27, PF-WAT-018 p.8). Improvement work would occur prior to log hauling (Table 2.2-8, DEIS).

Comment 51.09. The DEIS does not analyze the effects of roads increasing water transport during storm and snowmelt events, which in turn elevate water yields and peak flows. (81-75)

Response: Water yield from proposed activities is discussed on pages 18-20 of PF-WAT 001 and analysis is provided in PF-WAT-008. Roads occupy only a small percentage of watershed area, minimizing water yield effects from this source. Harr et al. (1975), reports that “peak flows
were increased significantly after road building, but only when roads occupied at least 12% of the watershed. Roads had no detectable effect on volumes of storm hydrographs.” This study was conducted in the Pacific Northwest where precipitation (and runoff) is greater (60 to over 100 inches of rainfall/year) than in the Gold Butterfly project area where precipitation is much lower, about 14-27 inches. Willow Creek, with the greatest road density of the project area watershed has less than 2% of its area in roads. It is unlikely that the flow regime would be affected by cumulative road surface area (PF-WAT-001 and WAT-008). See also the Response to Comment 5l.06.

Comment 5l.10. The DEIS relies upon BMPs to address the issues associated with logging roads. However, comprehensive monitoring of the effectiveness of logging road BMPs in achieving water quality standards does not demonstrate the BMPs are protecting water quality, nor does it undermine the abundant evidence that storm water infrastructure along logging roads continues to deposit large quantities of sediment into rivers and streams (Endicott, 2008). Even as new information becomes available about BMP effectiveness, many states do not update their logging road BMPs, and some states have retained BMPs that have been discredited for some time, such as using fords when they are known to have greater water quality impacts than other types of stream crossings. (Id.) If the measure of success is whether a nonpoint source control program has achieved compliance with state water quality standards, the state forest practices programs have failed. (81-77)

Response: Biannual BMP audits are conducted in Montana on a variety of land ownerships by a team representing multiple land use agencies and private land owners. In 2016, this audit process found that BMP application on Federal lands was rated as 96 percent compliant and 98 percent effective (PF-WAT-001 p. 12). The Bitterroot National Forest also has an extensive monitoring program conducted by specialists that evaluate implementation and effectiveness of BMPs during and after project implementation. This information is reported in Forest Plan Monitoring Reports most recently in 2014-2015 but dating back to 2000 and used to better plan future project and modify design features.

Comment 5l.11. The DEIS does not disclose if a TMDL has been prepared for Willow Creek, nor explain how project activities would be consistent with the TMDL. (81-151)

Response: In the FEIS Chapter 3 p. 16 it is noted that Willow Creek is a water quality impaired stream with a designated impairment for sediment. In PF-WAT-001 on page 2 streams with TMDL’s developed are identified and on page 6 and 9 the TMDL is summarized for Muddy Springs Creek and Willow Creek respectively. TMDL’s are also discussed on page 11. Information was added to the FEIS and to WAT-001 in the Effects Common to Both Alternatives section on the TMDL for Willow Creek. The restoration plan in the TMDL recommends reduction in sediment from forest roads in Willow Creek and the BMP upgrades, storage and decommissioning moves towards that reduction.


The project is consistent with Montana Impaired Water (303(d)) programs (PF-WAT-001 p. 31).

Comment 5l.12. The DEIS does not distinguish in its estimates of sediment percentage increases the amounts attributable to restorative actions, such as decompacting roads in RHCAs or removing culverts, from other road maintenance and construction activities, including installing culverts. The DEIS has little quantitative sediment analysis. (81-152)
Response: Details regarding sediment analysis are found in project file documents PF-WAT-001, PF-WAT-020, PF-WAT-018, and PF-WAT-036. In the Summary of Analysis in PF-WAT-001 p.2 is a short discussion road decommissioning and storage effects. Analysis methodology is summarized on page 12 of PF-WAT-001 the Specialist Report, in PF-WAT-12 a summary of harvest effects on sediment, PF-WAT-020 the haul route sediment assessment and PF-WAT-36 sediment assessment for road recontour. WEPP output is found in PF-WAT-006, PF-WAT011, and PF-WAT-022. In PF-WAT-001, Effects Common are described on pages 15-17, Direct and Indirect effects of project proposals are discussed on pages 17-29 and include assessment for culvert removals and installation and recontour of FR 696A (p. 23 and Table 8 on the same page).

Comment 5l.13. The DEIS does not disclose how percent sediment increase and decrease figures are obtained or the accuracy of sediment predictions. (81-153)

Response: The Watershed Specialist Report (PF-WAT-001), the sediment analysis (PF-WAT-020) and PF-WAT-018 describe in detail the watershed analysis. PF-WAT-001 page 12-13 and page 4-5 of PF-WAT-020 summarize the methodology used and accuracy of predication. PF-WAT-001 page 21-25 is the description of the sediment assessment and analysis results and PF-WAT-018 and PF-WAT-020 provide additional details. PF-WAT-012 describes modeling conducted for vegetation management on similar projects and the monitoring results of those related to sediment contributions to streams. WEPP output for haul route generated sediment is tabulated in PF-WAT-006 and PF-WAT-022.

In summary the Water Erosion Prediction Project (WEPP) model was used to estimate sediment production on roads and harvest units. Road generated sediment was estimated for the existing condition, during log haul with and without BMPs applied and after project completion with BMP’s maintained and functioning and results are reported on Chapter 2 page 12 of the DEIS, page 22 of PF-WAT-001 and in PF-WAT-020. Sediment estimated to be produced from road decommission and storage is displayed on page 23 of PF-WAT-001 with discussion on pages 24-26. Harvest produced sediment is summarized PF-WAT-001 on p. 2, 15, 17, 25 and in PF-WAT-012. The accuracy of the WEPP model is plus or minus 50% the predicted rate and is comparable to other sediment prediction models (PF-WAT-020 p. 4-5).

Comment 5l.14. The DEIS states "Sediment inputs from project elements high in the watershed (installation of new crossings, road decommissioning, and low levels of road use) are not expected to contribute measurable quantities of sediment into fish bearing waters." Does this mean the prediction is zero? (81-154)

Response: The proposed project would incorporate a series of protective RHCAs that have been demonstrated as extremely effective in protecting streams (see Forest Plan Monitoring Reports 2003-2015). Substantial information describing the effectiveness of these design feathers is contained in the Fishery Specialist Report. This information supports the conclusion that the proposed projects, including vegetation treatments, would have no effect on riparian condition. This information will be incorporated into the FEIS.

Overall the sediment assessment (PF-WAT-020) predicts a minor sediment increase from log haul near stream channels in Willow Creek. Assessment results suggest none of the alternatives would threaten beneficial uses or water quality in the Burnt Fork. All practical means to minimize sediment are included in action alternatives. (PF-WAT-001 p. 2)
Comment 5l.15. The DEIS does not disclose any quantitative analysis to support the statement that new roads were designed to have limited contact with water. (81-155)

Response: Conclusions in the DEIS regarding estimated sediment inputs to project area streams rely on an extensive body of peer-reviewed science based on statistically robust, repeatable methods that clearly demonstrate reductions in sediment deliver and protection of aquatic habitat associated with the type of road improvements and BMPs required as part of both Action Alternatives. Substantial information describing the effectiveness of these design features are in contained in the Fishery Specialist Report (PF-FISH-001).

Proposed new road locations were designed to be outside of sediment contributing distance except at 3 locations (2 ephemeral crossings in the Birch Creek HUC and one intermittent stream crossing in upper Eastman Creek, a tributary to Willow Creek (PF-WAT-001, p.17). Proposed road locations are mapped and displayed in Appendix B of the DEIS. Log landings, temporary roads and tracked line machine trails will not be located in the RCHAs. There may be locations where temporary roads or tracked line machine trails may cross intermittent headwater channels not indicated on maps. Should this occur, the hydrologist or fish biologist will work with TSAs to design crossings that do not degrade riparian dependent habitat or species (FEIS Chapter 2 Table 2.2-8).

Comment 5l.16. Indicators of sediment delivery are a very rough proxy for data. The DEIS states "other than culvert removals, the project element most likely to deliver sediment to fish bearing streams is log hauling on project area roads and the maintenance activities needed to facilitate hauling." Indicators of sediment delivery do not allow for an itemized presentation of such impacts. (81-155)

Response: Please refer to PF-WAT-020 and the Watershed Specialist Report (PF-WAT-001) for more information on the sediment assessment. Also the Response to Comment 5l.06, 5l.07, 5l.08, 5l.12, 5l.15.

Comment 5l.17. Percent increases is a rough and misleading proxy for tons of sediment, which is a more accurate representation for sediment amounts. (81-157)

Response: The model estimated sediment contributions in pounds rather than tons. We believe that using the percent change to discuss effects would be better understood by our readers.

Please refer to PF-WAT-020 and the Watershed Specialist Report (PF-WAT-001) for more information on the sediment assessment. Also the Response to Comment 5l.06, 5l.07, 5l.08, 5l.12, 5l.15.

Comment 5l.18. The DEIS does not provide data to support the statement "although higher numbers of log truck loads under Alternative 2 would degrade the water quality-protecting BMPs faster, the requirement that maintenance of BMPs would be 'commensurate with use,' enforceable with the timber sale contract, would mitigate much of this risk. Under this design feature, more maintenance would be carried out at higher levels of use to keep the road surface BMPs effective." (81-159)

Response: The timber sale contract requires the purchaser to maintain roads before, during, and after haul. Maintenance must be commensurate with purchaser’s use and to the specifications described by the FS in the contract. This includes the upkeep of BMP structures such as drive-through dips, ditches, and culverts. This requirement is included as a design feature and listed in FEIS Chapter 2 Table 2.2-8.
Comment 51.19. The DEIS lacks statistical rigor and scientific integrity to support the claim of net improvement in long-term sediment reductions to streams. (81-160)

Response: The proposed project would incorporate a series of protective RHCAs and BMPs that have been demonstrated as extremely effective in protecting streams (see Forest Plan Monitoring Reports 2003-2015). Substantial information describing the effectiveness of these design feathers is contained in the Fishery Specialist Report. This information supports the conclusion that the proposed projects, including vegetation treatments, would have no effect on riparian condition. This information will be incorporated into the FEIS.

Conclusions in the FEIS regarding estimated sediment inputs to project area streams rely on an extensive body of peer-reviewed science based upon statistically robust, repeatable methods that demonstrate reductions in sediment deliver and protection of aquatic habitat associated with the type of road improvements and BMP’s required as part of both Action Alternatives.

Please refer to PF-WAT-020 and Watershed Specialist Report (PF-WAT-001) for more information on the sediment assessment. Also the Response to Comment 51.06, 51.07, 51.08, 51.12, 51.15.

Comment 51.20. The DEIS does not demonstrate consistency with Forest Plan water, air, soil Standard 1, which requires the FS to "Utilize equivalent road area or similar concept to evaluate cumulative effects of project involving significant vegetation removal, prior to including them on implementation schedules." (81-169)

Response: Equivalent clearcut area (ECA) is used as a proxy for equivalent road area in the Gold Butterfly analysis. The Watershed Specialist Report (PF-WAT-001) page 18-20 and 26 describe the changes in ECA that are predicted with Alternative 2—the maximum treatment alternative. Results indicate that the proposed action would treat too little area to have more than minor effects on the water yield in the Willow Creek watershed, where most activity would take place. PF-WAT-008 provides the data used to calculate ECA. Discussion related to Alternative 3 are found on page 27 and 29.

The watershed analysis is consistent with the Forest Plan:

- Water quality is maintained and improved in the Burnt Fork municipal watershed (DEIS Chapter 3. P. 9-11; PF-WAT-001 p. 16, 18, 26; PF-WAT-020 p.3, 6-7).
- Soil productivity, water quality and quantity maintained (DEIS Chapter 3 p. 8-12; PF-WAT-001 p. 17-29, PF-WAT-020, PF-WAT-018, PF-SOILS-001).
- Riparian areas are managed to prevent adverse effects to riparian dependent species (DEIS Table 2.2-8; PF-WAT-001 p. 15, 19, 22).
- ECA is used to evaluate cumulative effects. Regeneration harvest comprise a small percentage of the proposed vegetation management treatments (PF-WAT-8).
- Soil and water conservation practices are part of project design (DEIS p. VI, Chapter 2, Table 2.2-8; Chapter 3 p. 8, 11; PF- WAT- 001 p. 3-4).
- Sediment will be reduced from forest roads (FEIS Chapter 3 p. 23-24; PF-WAT-001 p. 2, 15-16, 17, 21-26, 28-29; PF-WAT-020. PF-020).

Comment 51.21. The DEIS does not analyze the hydrologic implications of cumulative soil damage caused by past management in the project area watershed. (81-209)
Response: Soil productivity is site specific and can vary from one square foot to the next with each area functioning independently. Assessment of cumulative effects on soil productivity at scales larger than the specific treatment unit boundary (such as the watershed scale) misrepresents the effects of management activities by diluting the site specific effects across a larger area. Project cumulative effects are described in the Watershed Specialist Report (PF-WAT-001) on page 18-20 and in the Soils Specialist Report (PF-SOILS-001, p. 14-17).

Pages 18 and 19 of PF-WAT-001 discuss the hydrologic effects of vegetation management from the proposed actions. Compacted soils occupy a small percentage of the project area. In the Willow Creek watershed, with the highest road density of the Gold Butterfly project area is estimated to have less than 2% of its area in roads. Research in the coast ranges of Oregon and Washington where precipitation is much higher than in the developed portion of the project area found that peak flows increased when roads occupied at least 12% of the project area. Given the differences in precipitation is it unlikely the flow regime will be impacted by cumulative road area.

Soil standards require that 85% of area for each harvest unit meet productivity standards before the unit is considered done. Slash and woody debris are required to meet specific standards. All of these characteristics enhance water infiltration and sediment filtering efficiency (PF-WAT-001, p.15).

Cumulative effects of harvest are primarily the result of past ground based yarding that did not adhere to soil protection measures that would be applied to proposed actions. These are outlined in design features (DEIS Table 2.2-8) for the Gold Butterfly project and reduce the risk and extent of soil disturbance (PF-SOILS-001 p. 2 and 5). Design Features (Chapter 2) and Montana BMPs and SWCPs (Appendix A) are prescribed to limit the severity of any soil damage or its areal extent. The design features will also speed along recovery which will greatly reduce the DSD acres on temporary roads, skid trails, and landings. Based on field surveys, soils are recovering and recovery will continue.

Proper skid trail designation and spacing will ensure soil disturbance does not exceed R1 soil quality standards (PF-SOILS-001 and PF-SOILS-007).

Comment 51.22. The DEIS states "Plans, guidelines, and environmental impact statements have related the predicted amount of soil compaction to a defined threshold of compaction totaling 12 percent of watershed area.” The 12 percent figure is arbitrary. Flow changes at lesser amounts of compaction may also cause adverse impacts. Without reference to the stream channels in question, we cannot say nothing will happen until the 12 percent figure is surpassed. (81-210)

Response: Compaction typically occurs on heavily used skid trails, landings and roads. In PF-WAT-001 (p.19), total roaded area was estimated at 2% in Willow Creek-the watershed with the greatest road density. Harr et al., 1975 found that in studies in the Pacific Northwest where precipitation ranges from 60-100 inches that peak flows were increased significantly when roads occupied 12% of the watershed. Willow Creek has the greatest road density of project area watersheds at 2%. Precipitation is much less in the Gold Butterfly area ranging from 14-26 inches in the area proposed for treatments to 45 inches in the highest elevations of Gold and Willow Creek.
Currently BMPs, Soil and Water Conservation Practices (SWCP), Forest Plan standards and guidelines are applied to sustain site and soil productivity. Design features include in the Gold Butterfly project to meet and exceed BMPS and WSCPs and maintain soil productivity and water quality (FEIS Chapter 2 Table 2.2-8). Refer also the discussion on watershed and soil cumulative effects found in PF-WAT-001 and PF-SOILS-001).

Comment 5I.23. The DEIS does not disclose the number of years the benefit of bringing roads up to BMP standards will last or how soon roads will return to pre-project conditions without maintenance. Please include a more accurate accounting of sediment increase and decrease throughout and after the project without proper maintenance (92-19, 92-20)

Response: The purpose of the FEIS is to analyze the effects of implementing the Gold Butterfly project, not the effectiveness of BMP’s after the project is completed and into the future. That being said, at the end of the sale, final maintenance would restore function and effectiveness of BMPs (PF-WAT-001 p. 24). Sediment analysis suggests planned BMP improvements would reduce sediment associated with recreation use below the existing levels after the timber sale is completed.

The Willow Creek watershed would benefit over the longer term (post-timber sale to about 25 years, or the life of the BMPs) due to a substantial reduction in chronic road sediment (PF-WAT-001 p. 2). Proposed BMPs vary in their durability; rock-lined ditched and inlet catch basins last decades but experience suggests that blading would need to occur every 2-3 years to maintain BMP function related to road drainage (PF-WAT-020 p.2). See also the Response to Comment 5I.21.

Comment 5I.24. The DEIS does not provide assurances that project activities will only use water sources that are legal and will not impact water supplies relied upon by residents and native species. (94-3)

Response: The Gold Butterfly project does not include plans for water withdrawal from area streams. See proposed alternatives in Chapter 2 of the DEIS.

Water yield discussion can be found on pages 18-20 of the Watershed Specialist Report (PF-WAT-001). In summary, potential water yield effects were analyzed with the equivalent clear cut area methodology. Hydrologic units within the project area would remain well below thresholds thought to increase downstream flows except in the Birch Gulch HUC. A small portion of this hydrologic unit is on national forest; much of that is proposed for vegetation treatments and may result in overall increase in soil moisture and minor flow increases downstream. Increases would be undetectable a short distance downstream due to the dilution effect of un-treated contributing areas. Water yield increases are expected to pose no threat to local or downstream channel stability or beneficial uses.

Comment 5I.25. The DEIS does not fully analyze and disclose all ongoing damage where project funding cannot address the full scope of insufficient road maintenance issues. (81-63)

Response: The design features would be used in conjunction with actions proposed in the alternatives. Implementation of either alternative requires that design features be followed to achieve desired results or mitigate effects (FEIS Chapter 2 Table 2.2-8). All practical means to minimize sediment production are included in the action alternatives, including water resource protection in the planning design and implementation phases. Action alternatives are consistent with Forest Plan direction, policy, regulation and law concerning water resources (PF-WAT-001 p. 2). The watershed analysis is based upon the inclusion of design features and application of...
BMP’s (PF-WAT-29, PF-WAT-30, PF-WAT-31). Activities are included in proposed alternatives that meet BMP standards, move towards TMDL/Watershed Improvement Plan goals and fulfill USFS water quality obligations to the State of Montana (PF-WAT-001 p. 4).

See also the discussion on Desired Condition and Regulatory Consistency and Compliance found on pages 10-13 and 29-30 of PF-WAT-001 and the Response to Comment 5l.26.

Heritage

Comment 5m.01. Many old trees have high cultural value as "peel trees." Cutting these trees would erase important local history. (6-19)

Response: See Heritage design features in FEIS Chapter 2, Table 2.2-8 for protections of known and newly discovered blaze trees.

Insect and Disease

Comment 5n.01. The DEIS cites an on-going mountain pine beetle epidemic to justify thinning. The epidemic appears to be over and thinning has not been demonstrated to reduce mountain pine beetle mortality in epidemic conditions. (36-34)

Response: Within the Silviculture Specialist Report (PF-SILV-001) the risk of bark beetle predation statement is stated as “Populations of western pine beetle (*Dendroctonus brevicomis* LeConte) and populations of mountain pine beetle (*Dendroctonus ponderosae* Hopkins) are currently low in the area. However, forest conditions are suitable to increase and increase tree mortality. Douglas-fir beetle (*Dendroctonus pseudotsugae* Hopkins), is currently very active in the project area. Current conditions within the project area such as host species, size, and stand density, create moderate to high conditions beyond the historic range. Mountain pine beetle has been active in the project area approximately for the past ten years, and much of the lodge pole pine and whitebark pine has been targeted with huge mortality. Recent mountain pine beetle activity has significantly declined however; current stands of ponderosa pine are rated moderate to high hazard because of high basal areas and high tree densities. Although mountain pine beetle activity appears to be declining, additional tree mortality may occur in stands with higher stocking densities and should be treated silviculturally to reduce hazard and long term sustainability. The basal area of stands visited ranged between 120-180 square feet per acre. For ponderosa pine, stands with basal areas exceeding 150 square feet per acre and average diameters greater than 8” are considered highly favorable for mountain pine beetle outbreaks (Schmid et al. 2007). Also, weather patterns over the next few years will partly determine future mountain pine beetle trends in on the Bitterroot National Forest.”

Comment 5n.02. Proposed treatments include retaining the healthiest trees. However, it is uncertain which trees will be most resilient to disease, insects, or climate change, and will be the healthiest ones in the future. Literature has cited how seemingly diseased trees actually turned out to be the best adapted to drought and climate change. Will your selection methods be detrimental to selecting for adaptive genetics? (36-37)
Response: The biggest and healthiest trees are best adaptive to insects and disease and usually the most resilient to other factors.

Comment 5n.03. USFS literature states that mistletoe is more prevalent in open stands than dense stands. Does it then make any sense to thin them? Fire is shown to be an effective control. (36-41)

Response: It is silviculturally not desirable to thin Douglas-fir trees with mistletoe since thinning of these trees does not reduce or remove mistletoe. See pages 14 and 29-34 in the Silviculture Specialist Report (PF-SILV-001).

Comment 5n.04. Douglas-fir within the project area have had dwarf mistletoe for decades, yet it appears dwarf mistletoe rarely kills trees. Infected trees provide a multitude of ecological benefits and have remaining resilient to mistletoe and other stressors. (40-31, 41-3)


Comment 5n.05. It is possible previous logging within the project area and warmer / dryer conditions today are factors in dwarf mistletoe and other insect damage being greater than historical levels. The ecological balance of forest stands may be changing to include more mistletoe and tree-damaging insects as climates warm. If so, logging and prescribed burning may be ineffective at improving long-term forest viability. (60-2)

Response: We agree that past silvicultural practices, if implemented incorrectly, and changing climatic conditions may lead to Douglas-fir dwarf mistletoe levels that are currently greater than historic levels. However, this does not preclude the use of current silvicultural practices from addressing insect and disease issues to improve forest stand health.

Comment 5n.06. The DEIS does not provide the scientific support that active management is needed to promote forest health and resiliency, and the scientific basis for its conclusion that modifying forest structure, composition, and fuels will improve landscape resilience to disturbances (such as insects, diseases, and fire). Best available science indicates that weather and climate change patterns will determine potential fire severity, regardless of whether a landscape has been logged (78-13, 78-14)

Response: See Silviculture Specialist Report (PF-SILV-001, p. 29-38) for treatment options to address forest health and resilience.

Invasive Plants

Comment 5o.01. The construction of new roads and re-opening of previous vegetated roads leads to the introduction and spread of invasive weeds. (16-5, 33-3, 34-2, 36-50, 40-21, 41-6, 47-1, 78-28, 110-1, 111-2)

Response: The effects of road construction on invasive plant introduction is covered on pages 4-5 of the Invasive Plants Specialist Report (PF-INVASIVES-001).

Comment 5o.02. Logging and soil disturbance in old growth stands will result in the replacement of native ground cover with invasive weeds. (36-54)

Response: The effects of soil disturbance on invasive plant introduction is covered on page 5 of the Invasive Plants Specialist Report (PF-INVASIVES-001).
Comment 5o.03. Soil productivity seems to be permanently lost due to weed infestations that follow timber sales. (73-32, 39-9, 116-14)

Response: The effects of vegetation management on soil productivity is discussed on pages 16-17 of the Soil Specialist Report (PF-SOILS-001).

Comment 5o.04. Please disclose the project expenditures for each step related to meadow restoration efforts involving herbicide and biocontrol treatments, conifer encroachment removal, and underburning. (81-234)

Response: The cost of herbicide treatments in a meadow can vary depending on how accessible the area is and thus the equipment being used to treat it. Backpack and handline spraying can start at $65/ac and run up to three times that amount. Biocontrol typically cost about $.50 / cyphocleonus acates insect with a release being at least 50 weevils or more. One release is generally put out for every 5 acres.

Comment 5o.05. The DEIS lacks an analysis of the effectiveness of the forest-wide noxious weed treatment program. The DEIS states "Herbicide treatments along roadsides and trails on the Forest have shown measurable success in the suppression and containment of invasive/noxious weed species." This statement is not supported by Forest Plan monitoring or evaluation reports. (81-236)

Response: Current treatments are maintaining or reducing the number of invasive plants along roadsides and trails. Due to the lifespan of most invasive plant seed it will take many years before that seedbed is exhausted and treatments are no longer needed therefore the existing population cannot be eliminated from the inventory database. Continued inventory and more accurate mapping of invasive species are being added to the database so the overall acreage of infested species increases even though the number of plants has declined.

Comment 5o.06. Disclose the forest-wide trend in noxious weed infestations in acres or another metric. (81-237)


Comment 5o.07. Weeds should be analyzed as a significant issue for the project. The nature of cheatgrass has made introducing fire to the landscape ineffective in regenerating native species. A timber sale disturbs the soil which gives weeds, especially cheatgrass, a chance to take over. (92-28)

Response: Potential project impacts on invasive plants, including cheatgrass, is included in the Invasive Plants Specialist Report (PF-INVASIVES-001, pg. 1-8).

Comment 5o.08. Meadow hawkweed is present near treatment unit 80. St. John’s wort, knapweed, and cheatgrass seeds are easily transported to the area and soil disturbance has the potential to spread weeds through a number of avenues. The project should address more than just spraying along roads and washing equipment as mitigation measures. (92-29)

Response: FEIS Chapter 2, Table 2.2-8 lists mitigation measures and best management practices which not only includes roadside treatment and washing equipment but biocontrol and revegetation.

Comment 5o.09. How do the weed mitigation measures differ from those used on past projects? Some past project areas are now covered with a ground cover of knapweed, cheatgrass, and St John's Wort, with the weed problem proportional to how much the ground was disturbed and how much the canopy was
opened. Do weed seeds just occur everywhere, and the soil disturbance and direct sun the disturbances that allow them to propagate, with the washing of equipment having little preventive effect? (120-19)

Response: See pages 1-4 of the Invasive Plants Specialist Report (PF-INVASIVES-001). These weed species are already present in the project area. The object of the mitigation measures is to prevent further spread outside the area as well as any new invaders from establishing here.

Comment 5o.10. Will weed monitoring and treatment occur after project completion? (120-20)
Response: Yes, see FEIS Chapter 2, Table 2.2-8 invasive plants mitigation measures

Comment 5o.11. Do prescribed fires promote the spread of weeds, especially cheatgrass? (120-21)
Response: Low to moderate severity fire carries a lower risk of invasive plant increase and a higher probability of native species recovery at current levels. Prescribed fires would fall into this classification. See page 4 of the Invasive Plants Specialist Report (PF-INVASIVES-001).

Inventoried Roadless Areas

Comment 5p.01. The DEIS fails to analyze and disclose cumulative management activities including those proposed in the DEIS, which affect the wilderness attributes and roadless characteristics of the entire roadless expanse. The FS must conduct an analysis of the Roadless Expanse which includes the Stony Mountain Inventoried Roadless Area (IRA) and contiguous un inventoried roadless areas. (81-225, 81-226, 81-227, 81-228)

Response: Refer to pages 2 and 8 in the Roadless Area Specialist Report (PF-IRA-001).

Comment 5p.02. The DEIS fails to acknowledge the best scientific information that recognizes the high ecological integrity and functioning of roadless and unmanaged areas. Management activities have damaged the streams and other natural features found in the project area. (81-229)

Response: Refer to pages 7-8 in the Roadless Area Specialist Report (PF-IRA-001).

Miscellaneous

Comment 5q.01. The Forest Service has not undertaken the task to determine the reliability of all the data used as input for the models, validation of models, or limitations of models used in the Gold Butterfly analyses (81-198, 81-199, 81-201).

Response: Assumptions and limitations of models and model outputs are disclosed in specialist reports.

Comment 5q.02. The Forest Service has not undertaken the process of a science consistency review for the Forest Plan of for the DEIS's conclusions (81-202).

Response: Science consistency review of the Bitterroot National Forest Management Plan is beyond the scope of this project.

Comment 5q.03. Disclose the biological assessment for ESA-listed species and their critical habitat to allow for an analysis of the agency's determination on proposed action effects on listed species and habitat (73-35, 78-4, 78-41, 81-164, 92-9).
Response: Biological assessments for bull trout, Canada lynx, and grizzly bears can be found in the Project File (PF-FISH-004 and PF-WILD-004).

Comment 5q.04. Residents along Willow Creek Road were not notified of the project in a timely fashion so as to find time to research the effects on their health (92-12).

Response: A public meeting was held in Corvallis, MT on April 18, 2017 to discuss the project. All mailing addresses along Willow Creek Road listed in the Montana cadastral database were sent a post card notifying them of the meeting date, location, and topic. Additionally, a Forest Service press release was posted on April 13, 2017 notifying the public of the meeting as well as an article in the Ravalli Republic published on April 17, 2017. A follow-up public open house was held in Hamilton, MT on May 17, 2017. This open house was announced via Forest Service press release, Forest Service email, and on KLYQ 1240 radio. Notice of Intent to prepare an EIS was published in the Federal Register on June 9, 2017. Opportunity to comment on the Draft EIS was published via legal notice in the Ravalli Republic on June 17, 2018 and announced via Forest Service press release on June 19, 2018 and via Forest Service email and physical mail to all individuals who expressed interest in receiving information on the project. See FEIS Chapter 1, Section 1.7 Public Involvement and Collaboration discussion.

Comment 5q.05. The DEIS does not disclose studies to ascertain the possible effects of dust from the vermiculite mine in the area. Operations related to the project have the potential to introduce vermiculite dust into the air that exists on area roads and in harvest units (92-13).

Response: See discussion on vermiculite mine in FEIS Chapter 3, Past Present and Reasonably Foreseeable Activities for the Cumulative Effects Area section.

Comment 5q.06. An investigation of studies on dust from haul routes and its effect on human health should also be conducted and made available to the public to allow an opportunity to comment on this information before the FEIS (92-14).

Response: See FEIS Chapter 3, Section 3.5 on Public Health and Safety for a discussion of potential effects of haul-generated road dust.

Comment 5q.07. The purpose and need was developed, in part, from recommendations made in two ecosystem analyses at the watershed scale (EAWS): the Burnt Fork EAWS (2004) and the Daly-Gold EAWS (2008) (PF-REF-001). Disclose the entire set of recommendations from those EAWS in defining the scope of actions to take. (81-20)

Response: The Burnt Fork and Daly-Gold EAWS are incorporated by reference in the FEIS Chapter 1 (page 4), the documents can be found in the Project File (PF-REF-001).

Old Growth

Comment 5r.01. Old growth is a relatively rare feature on our Forest. Lesica (1990) estimated OG occupied 20-50% of pre-settlement forest landscape in low to mid elevation habitats (Chapter 3, page 30 in DEIS). Table 3.4 states the Sapphire Area contains only 10% OG, so there is less than half of historic levels of OG. The 1987 Forest Plan requires "sufficient old growth habitat on suitable timberland to support viable populations of old growth dependent species" (p. II-5). HFRA states "covered projects shall fully maintain, or contribute toward the restoration of, the structure and composition of old growth
stands according to the pre-fire suppression old growth conditions" (p. 7-8). (Jeff is this ‘tues or taken out of context?’) (36-52, 40-25)

**Response:** Not a substantive comment. Effects to old growth are discussed in the wildlife and vegetation specialist reports.

**Comment 5r.02.** Old growth on the Bitterroot National Forest is not near historic levels. Forest Service literature states that 20 - 50 percent of low/mid-elevation land was old growth habitat. Forest Service literature also states that currently only about 10 percent is found in the Sapphire Geographic region. Clear cutting (or the equivalent) is moving in the wrong direction. (45-14)

**Response:** Condition of old growth is discussed in the Wildlife and Silviculture Specialist Reports (PF-WILD-001 and PF-SILV-001). Large portions of the Sapphire Geographic region are high elevation and not low to mid-elevation.

**Comment 5r.03.** Forest management plan standards on old growth state that old growth stands may be logged and regenerated when other stands have achieved old growth status Standard 5 Forest management plan 11-20. Yet the DEIS states that it is deficient in old growth in the area. This project is in violation of the old growth standards in the Forest management plan. (92-37)

**Response:** Third order drainage 04a242-1 (FEIS Chapter 3, Table 3.4-2) is the only drainage in the project area where existing conditions for old growth are below Forest Plan standards (existing condition is 4.3%, Forest Plan standard is 8%). No harvest of old growth is proposed under Alternative 2 for this third order drainage.

**Comment 5n.04.** The Forest Service is unable to demonstrate it is managing the Bitterroot National Forest consistent with Forest Plan Wildlife and Fish Standard number one: "The amount and distribution of old growth will be used to ensure sufficient habitat for the maintenance of viable populations of existing native and desirable non-native vertebrate species, including two indicator species, the pine marten and pileated woodpecker." What is the scientific basis for the Forest Plan "amount and distribution of old growth"? (81-23)

**Response:** Evaluation of old growth as discussed in the Bitterroot Forest Management Plan is beyond the scope of this project.

**Comment 5n.05.** The DEIS includes an objective of old-growth logging: "Removal of dead, dying and high risk trees to improve stand health, and recover value however, maintaining appropriate numbers of snags, broken live topped trees and down logs for wildlife and future coarse woody debris needs… We recognize that some large trees would be cut and removed." The Forest Service fails to recognize what is unique about old growth - the decadence, rot, snags, down logs, patchy irregular canopy layers which cannot be created by but would be harmed by proposed management actions even though they are habitat characteristics critical for maintaining wildlife species viability. (81-29)

**Response:** This is covered in the wildlife and vegetation specialists report.

**Comment 5n.06.** Have all the stands making up the "6,714 acres of old growth habitat on Bitterroot National Forest lands in the third order drainages that are wholly or partially within the Gold Butterfly project area" been field surveyed for this project analysis? (81-43)

**Response:** Proposed units were field verified by a certified silviculturist and the Wildlife Biologist. If a unit had characteristics similar to OG standards a stand exam was completed to verify. Areas of old growth outside of proposed treatment units used the best available data from previous stand exams and the wildlife database.
Comment 5n.07. The DEIS does not provide a diameter limit on trees to be cut in old growth stands. The DEIS fails to explain how this meets HFRA requirements. (81-44)

Response: Title VI of the Healthy Forest Restoration Act requires the project to maximize the retention of old growth and large trees, as appropriate for the forest type, to the extent that the trees promote stands that are resilient to insect and disease. A diameter limit is not specified in the HFRA language.

Comment 5n.08. The DEIS does not properly analyze and disclose the natural historic range vs. current conditions regarding patch size, edge effect, and amount of interior forest old growth in the Bitterroot National Forest. (81-46)

Response: Vegetative response units are used to describe historic vs. current vegetative classes in the project area (see Silviculturist Specialist Report, PF-SILV-001, pages 7-13).

Comment 5n.08. Green et al. 1992 was never intended to set hard thresholds for old-growth criteria. The numbers were intended to be minimum screening criteria for possible old-growth stands from the timber stand database. According to the Green et al. 1992 the final determination of old growth status was to be made by a qualified ecologist or wildlife biologist. Further explanation is in USDA Forest Service, 1990a. Strict reliance on data base queries from the timber stand database has been shown to give unreliable results in past court cases and is no substitute for field investigation by qualified professionals. (81-48)

Response: Proposed units were field verified by a certified silviculturist and the wildlife biologist. If a unit had characteristics similar to OG standards a stand exam was completed to verify. Areas of old growth outside of proposed treatment units used the best available data from previous stand exams and the wildlife database.

Comment 5n.09. Green et al. 1992 arrived after the Bitterroot Forest Plan was adopted. In preparing and adopting these old growth guidelines, the Forest Service did not use an independent scientific peer review process, as discussed by Yanishevsky, 1994. It is premature for the Forest Service to base management decisions with long-term environmental effects on its Region 1 old-growth criteria, until these criteria are validated by the larger scientific community. (81-51)

Response: Green et al 1992 is the Regional direction for assessing and determining old growth.

Comment 5n.10. The Forest Service provides no assurance its old growth management objective will accelerate forest conditions toward old growth at some unspecified time in the future. There is no science or monitoring cited to support such claims. As Pfister et al., 2000 state: There is the question of the appropriateness of management manipulation of old growth stands. Opinions of well-qualified experts vary in this regard. As long term results from active management lie in the future - likely quite far in the future - considering such manipulation as appropriate and relatively certain to yield anticipated results is an informed guess at best and, therefore, encompasses some unknown level of risk. In other words, producing old growth habitat through active management is an untested hypothesis. (81-56)

Response: Old growth monitoring on the Bitterroot National Forest documents that old growth stands following treatment still maintain OG characteristics.

Comment 5n.11. The Forest Plan states (II-20) that "Sanitation and salvage harvests may occur in stands classified as old growth if old growth characteristics are retained after logging." but I am very concerned hearing that the definition of what meets "old growth" standards has been modified to allow thinning and ground disturbance. (109-4)
Response: The FEIS uses the U.S. Forest Service Region 1 guidelines for old growth criteria as defined by Green et al. (1992)

Comment 5n.12. Since old growth is partly an issue of maintaining viability of old-growth associated wildlife including Management Indicator Species (MIS) pileated woodpecker and pine marten, and viability is a forest-wide issue, the Forest Service must disclose forest-wide compliance with percentage standards in all MAs forest-wide for any claimed demonstration of viability to be meaningful. Table 3.4-3 is a start, but it does not indicate how well old growth is currently distributed across the Bitterroot National Forest and in each of the applicable Management Area units. (81-32)

Response: Assessment of old growth distribution across the Bitterroot National Forest is beyond the scope of this project.

Comment 5n.13. The DEIS old growth analysis includes such statements as: "The risk of losing existing ponderosa pine and/or Douglas-fir old growth habitat stands to mortality caused by intense competition for moisture making them more susceptible to insects and disease," "The risk of losing existing ponderosa pine -dominated old growth stands to mortality caused by the ongoing mountain pine beetle epidemic," "The risk of losing existing Douglas-fir -dominated old growth stands to mortality caused by Douglas-fir dwarf mistletoe and/or another outbreak of Douglas-fir beetle." Please reconcile those statements with the following best available science concerning forests: "(A)tributes such as decadence, dead trees …are important…" (Green et al., 1992). "Accumulations of large-size dead standing and fallen trees that are high relative to earlier stages." (Id.) "Decadence in the form of broken or deformed tops or bole and root decay." (Id.) "The big trees were subsidizing the young ones through the fungal networks. Without this helping hand, most of the seedlings wouldn't make it." (Suzanne Simard: http://www.ecology.com/2012/10/08/trees-communicate/) "Disrupting network links by reducing diversity of mycorrhizal fungi… can reduce tree seedling survivorship or growth (Simard et al, 1997a; Teste et al., 2009), ultimately affecting recruitment of old-growth trees that provide habitat for cavity nesting birds and mammals and thus dispersed seed for future generations of trees." (Simard et al., 2013.) (81-27)

Response: The old growth discussion in Chapter 3, Section 3.4 identifies risks to old growth, we acknowledge those parameters such as dead trees, snags, etc in the Wildlife and Silviculture Specialist Reports (PF-WILD-001 and PF-SILV-001).

Comment 5n.14. Provide supporting evidence for the statement that old growth treatments are needed based on an ongoing mountain pine beetle epidemic. (40-27)

Response: Proposed action does not state that old growth treatments are needed for an ongoing mountain pine beetle epidemic. The wildlife reports states many old large trees have been killed by Douglas-fir bark beetle but does not state this is the reason for treatment. Recent mountain pine beetle activity has significantly declined, however; current stands of ponderosa pine are rated moderate to high hazard because of high basal areas and high tree densities.

Comment 5n.15. It appears Alternative 2 would result in a net loss of old growth, which is already in deficit on the BNF. The Forest Plan states (II-20) that "Sanitation and salvage harvests may occur in stands classified as old growth if old growth characteristics are retained after logging." Please clarify this apparent discrepancy. (73-24)

Response: Alternative 2 does reduce old growth but meets applicable Forest Plan Standards. There are no planned sanitation or salvage harvest in old growth.
Comment 5n.16. What is the purpose of the Forest Plan old growth standards? What is the scientific basis the FS relied upon for the percentages the Forest Plan sets as standards, in the various MAs? Were those standard percentages based on the range of historical conditions for old growth on the BNF? If so, what was the source of the historical information? (81-31)

Response: Analysis of Bitterroot National Forest Management Plan standards is beyond the scope of this project.

Comment 5n.17. Disclose where in the old-growth criteria the presence of younger trees disqualifies a stand from designation as old growth. Please disclose where in the old-growth criteria the presence of "diseased and less desirable species" disqualifies a stand from designation as old growth. (81-41)

Response: Presence of younger trees and diseased and less desirable trees does not disqualify a stand from an old growth designation.

Rare Plants

Comment 5s.01. Does a rare Indian paintbrush occur within the project area and if so, how will it be protected? (39-10)

Response: Rocky Mountain Paintbrush does occur in several places in the project area. Please see FEIS Chapter 2, Table 2.2-8 for protection measures.

Comment 5s.02. The DEIS indicates the survey window was missed for units 11, 40, 75, 76, 160, 161, and 185. How will surveys of these units be completed prior to the FEIS and how will rare plants occurring in these units be protected? (92.39)

Response: Surveys for 11, 40, 75, 76, 160, 161, and 185 have all been surveyed in the 2018 survey season. Rare plants were found and protection measures are listed in FEIS Chapter 2, Table 2.2-8. Management proposals for Whitebark Pine are listed in the rare plants project file.

Comment 5s.03. How will protection of rare plants be monitored? (101-7)

Response: The timber sale administrator is responsible for ensuring operator compliance with timber sale contract provisions and implementation of project design features, including those listed in Table 2.2-8 to protect rare plants.

Recreation

Comment 5t.01. How will access be reduced or removed during project implementation? Will the Willow Creek trail be closed during winter months? (22-2, 27-2, 62-9, 82-2)

Response: Access to the project area will be closed to the public from 12:00 AM to 5:00 PM on weekdays. If log hauling operations cease or are substantially reduced, the weekday closure may be lifted or modified at the discretion of the District Ranger. See Public Health and Safety design features in Chapter 2, Table 2.2-8. Refer to pages 1, 11-13, and 15 in the Recreation and Trails Specialist Report (PF-REC-001) for discussion on impacts to project area access during project implementation.
Comment 5t.02. Recreation appears to be treated as a mitigation in the DEIS rather than a resource to be enhanced. We recommend more efforts to enhance recreational infrastructure in the long term. (38-9)

Response: The Burnt Fork Trailhead will be improved and enhanced to include more infrastructure and more recreation opportunities than the previous trailhead. Refer to pages 12 - 13 in the Recreation and Trails Specialist Report (PF-REC-001).

Comment 5t.03. ATV use should not be allowed in wilderness areas. Building new or reconstructing previous roads would promote ATV use. (42-3)

Response: No new road construction or reconstruction is proposed in wilderness areas. Refer to page 14 in the Recreation and Trails Specialist Report (PF-REC-001).

Comment 5t.04. Alternative 2 would open up the vegetatively reclaimed Butterfly Creek Road to full-sized vehicles during project implementation to Forest Service, purchaser, and contractor use. This road is of high recreation value. (78-9)

Response: NFSR 13111 will be closed to motorized post project implementation and available for non-motorized recreational use.

Comment 5t.05. We are concerned with the proposed construction of a new road descending from road 364 onto the ridge between Eastman and Butterfly Creek, and the commercial logging that would occur in this area, per the Alternative 2 proposed action. The road construction and the extensive commercial logging of this ridge would greatly impact the character of this area. We believe that this would be very detrimental to the experience of people recreating in this area, and would likely destroy many of the routes/trails that mountain bikers use. (59-4)

Response: The types of recreation activity have been evaluated and it is apparent that the project area gets a fair amount of use by non-motorized recreationists on closed roads and on user-created trails. However, these are user-created trails and not designated Forest Service trails. There are no design features in place to protect user-created trails. Refer to pages 14-16 in the Recreation and Trails Specialist Report (PF-REC-001).

Roads and Transportation

Comment 5u.01. The DEIS provides no commitments or assurances the road system will be maintained after the project is completed. (36-47, 36-66, 76-6, 78-1, 114-8, 120-12)

Response: Timber sale contract provisions require purchaser to restore haul routes to standard conditions following project implementation. Annual maintenance of U.S. Forest Service jurisdiction roads is contingent upon appropriations from U.S. Congress.

Comment 5u.02. The Forest Plan states: "roads will be closed to public use if adequate road maintenance funds are not available" (p. II-27). Existing road management within the project area has demonstrated this standard is not being followed. (36-66, 40-17, 41-5, 73-11)

Response: Maintenance occurs on project area roads (see PF-ROAD-012 and PF-ROAD-013 for road maintenance report). Roads are maintained in accordance with their road management objectives (PF-ROAD-010). Project activities include road improvements and BMPs to bring roads up to standards where needed.
Comment 5u.03. Forest Plan projected only 21 miles of new local road construction for the decade 2016-2026 (p. II-7). Alternative 2 proposes 23.7 miles of new road construction. Please disclose the discrepancy between the Forest Plan and proposed action? (36-68, 73-18)

Response: Alternative 2 proposed 6.4 miles of new permanent road and 17.3 miles of temporary road construction (FEIS Chapter 2, page 6 and Appendix A for unit by unit road construction lengths). Table 11-1 in the Bitterroot National Forest Management Plan (page II-8) projects an average annual output of 21 miles of permanent road between 2016 and 2025 (i.e. 210 miles projected over 10 years). That projection was contingent upon conditions and infrastructure needs being met in the preceding decades.

Comment 5u.04. The DEIS fails to disclose the identification of the minimum road system is required by subpart A of the Travel Management Rule, recommendations from the travel analysis report, does not provide information about the risks and benefits of the roads analyzed, or decision information about how roads proposed for decommissioning or storage were determined. (78-19, 78-32, 78-33, 78-35, 81-81)

Response: A minimum roads analysis, including a risks and benefits matrix, was conducted during project analysis in accordance with 36 CFR Part 212 and FSM 7703. See roads analysis document in Project File (PF-ROAD-009).

Comment 5u.05. The DEIS must fully disclose the direct, indirect, and cumulative impacts caused by existing and proposed roads when combined with the effects of its minimum road system. (78-20, 78-21)

Response: Direct, indirect, and cumulative effects of existing and proposed roads are disclosed in specialist reports where the presence of roads impacts a resource, for example sediment erosion into streams (see Watershed Specialist Report, PF-WAT-001).

Comment 5u.06. The DEIS fails to disclose the full nature of road maintenance activities on secondary roads. What is described as maintenance is more akin to reconstruction. See Forest Service Handbook 7709, 62.1 explaining that "[r]oad maintenance is not intended to substantially improve conditions above those originally constructed" and that "[w]ork performed to raise a stored road's service level above that to which it was originally constructed is considered to be road reconstruction and should be financed accordingly." (78-22)

Response: There are no proposed actions in the FEIS that would elevate the current maintenance level of existing roads within the project area. Undetermined roads that are added to the Forest Service road system would be maintained as a maintenance level one, the lowest maintenance level. Specialists have accounted for road management activities in effects analysis (see individual specialist reports).

Comment 5u.07. The Forest Service has a duty to identify the minimum road system it determines is needed to ensure the "identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance." 36 C.F.R. § 212.5(b). Under NEPA, it also has a duty to consider the effects of its proposed action when added to the existing road and trail system. The agency must consider the effects of its proposal to construct temporary roads when combined with the effects of its minimum road system. (78-30)

Response: A minimum roads analysis, including a risks and benefits matrix, was conducted during project analysis in accordance with 36 CFR Part 212 and FSM 7703. See roads analysis document in Project File (PF-ROAD-009). Existing and new proposed roads (temporary and permanent) were considered, cumulatively, for resource analyses where roads had a potential effect(s), for example see sediment analysis in Watershed Specialist Report (PF-WAT-001, pages
Comment 5u.08. Closing roads instead of decommissioning them is inconsistent with Forest Service policy, under which the agency is supposed to prioritize unneeded roads for decommissioning or other uses. (78-36)

Response: A minimum roads analysis (PF-ROAD-009) was used to inform project development on which roads are needed for current and future management needs. Maintenance level one roads needed for future management activities are proposed for storage, those roads not needed for future management activities are proposed for decommissioning.

Comment 5u.09. Pursuant to Forest Service directives the agency must carefully consider and document the road management objectives, environmental impacts, and social and economic benefits associated with any proposed addition before adding roads to its system, the DEIS fails to disclose this information. (78-37)

Response: Road management objectives are included in the project file (see PF-ROAD-010). Environmental impacts of proposed additions to the road system are disclosed in individual specialist reports.

Comment 5u.10. The DEIS states, "The interdisciplinary team examined existing roads in the project area, including undetermined roads, to determine the risks and benefits associated with each." How did the IDT examination compare to Fly et al., 2011 (a comprehensive inventory of erosion and sediment sources for a project on the Boise National Forest) for thoroughness? (81-61)

Response: Minimum roads analysis examines the risks and benefits of each road segment (see PF-ROAD-009). This analysis was conducted pursuant to 36 CFR Part 212 and FSM 7703-Policy.

Comment 5u.11. The DEIS fails to disclose the temporary effectiveness of all the road maintenance and upgrading, and fails to analyze and disclose the impacts of its continuously failing, under-maintained road system. (81-62, 81-64, 92-19)

Response: Road management activities and upgrades are covered under specialist reports. Future road maintenance will be carried out as necessary in accordance with road management schedule.

Comment 5u.12. The DEIS does not disclose the project area road management objectives, which were to be developed using the travel management regulations. (81-80)

Response: Road management objectives for the Gold Butterfly project area are included in the Project File (see PF-ROAD-010).

Comment 5u.13. The DEIS does not disclose if the project area was surveyed with the detail needed to determine if all non-system (e.g., "undetermined") roads existing in the project area have been identified, so their ecological liabilities can be accounted for. The DEIS does not present an analysis of the ongoing adverse impacts of the roads in the project area which will not be maintained or upgraded by the project. (81-82)

Response: Undetermined roads are listed in the U.S. Forest Service Infrastructure database. Lidar imagery exists for the project area and was used to verify the presence of any roads not.
Comment 5u.14. Forest Plan Standard #RF-2 requires development and implementation of a Road Management Plan or a Transportation management Plan, which must address, among other items, "Criteria that govern road …maintenance and management." What are the project area criteria? Also, "Requirements for pre-, during, and post storm inspection and maintenances." What are these requirements? (81-167)

Response: The language cited in this comment is not a Bitterroot National Forest Management Plan standard.

Comment 5u.15. Clarify how much decommissioning would actually be accomplished; since "Decommissioning a road removes it from the NF Transportation system" it follows that the 16.5 miles of undetermined roads cannot be removed from the road system because they are not on the system. (81-66)

Response: FEIS Chapter 2, Table 2.2-6 identifies road treatment, including decommissioning, mileages. See FEIS Appendix F for description of all road treatments by road segment length and treatment requirements.

Comment 5u.16. The Bitterroot National Forest and Ravalli County should develop a plan to maintain and rehabilitate Willow Creek Road and all roads open to public use during and after project implementation. (74-14)

Response: The FEIS (Chapter 2, pages 7-9) includes BMPs and road improvement measures to reduce sediment delivery from and improve Willow Creek Road during and following project implementation.

Silviculture

Comment 5v.01. According to the Forest Service, much of the ponderosa pine had been logged in the distant past from these slopes. The existing old growth was concomitantly growing there, side by side with the ponderosa pine. Could these sites/units of old growth as visited on the field trip benefit from some understory thinning? This could be performed by hand with cuttings piled and burned as appropriate or left behind on the forest floor. (40-32)

Response: A silvicultural prescription was developed specific to each treatment unit based on that unit’s vegetative conditions and the activity that would best shift existing conditions to desired conditions. Appendix A in the FEIS provides the silvicultural prescription for each treatment unit.

Comment 5v.02. Clear cutting was decided to be unsustainable in the Rockies long ago. Clearcutting results in non-selective timber cutting and same age regrowth. Where is the science that suggests clear cutting is a good practice today? (41-10, 97-4, 110-4, 115-3)

Response: This type of treatment is proposed in units that need to be “reset” based on the health of the stand, stand composition and current lack of resiliency to insects and disease. Many units are predominately Douglas-fir, have 90% or greater infection of mistletoe and have stand ages ranging from 80 -200 years old that are proposed for treatment. Other units proposed are in alignment for whitebark pine restoration and reducing effects from mountain pine beetle. Units
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dominated by lodgepole pine that are classed late seral are at high risk to mountain pine beetle and ages range from 100-120 years old. Many of the trees that are characterized as late seral are currently not sustainable, long lived, because of their decline due to insect and disease effects.

Comment 5v.03. The DEIS indicates project activities are to achieve or moving vegetation toward desired conditions as drivers of the project. It is where desired conditions are obtained. For example, the DEIS states, "The desired condition is an approximation of the forest composition and structure that is within the range of historical conditions." The Forest Plan has no desired conditions resembling those of the DEIS. The Forest Plan FEIS does not evaluate a scenario of achieving "the range of historical conditions." (81-190)

Response: The FEIS Appendix D provides a list of consistency between the Gold Butterfly project and the Bitterroot National Forest Management Plan. Evaluation of conditions that are or are not in the Forest Plan are beyond the scope of this project.

Comment 5v.04. The DEIS provides no plan disclosing the details on how a restored landscape would be sustained. In other words, how often treatments will occur, how extensive they need to be, which kinds of treatments will be necessary, how many miles of roads will be needed (both permanent and temporary), etc. (81-191)

Response: Details of treatment types, spatial scale, and road needs (temporary and specified) for each treatment unit are listed in the FEIS Appendix A. The objective behind treatment types in shifting vegetative conditions from existing to desired are discussed in FEIS Chapter 2, pages 1-6 and the Silviculture Specialist Report, pages 16-20 (PF-SILV-001).

Comment 5v.05. The DEIS assumes that if natural fire regimes were operating here practically all the low and mid-elevation forests would be in open conditions with widely spaced mature and old trees - mostly ponderosa pine with a few Douglas-fir. The FS fails to acknowledge best available science, such as that mixed-severity and even low-severity fire regimes result in much more variable stand conditions across the landscape through time. Assumptions that drier forests did not experience stand-replacing fires, that fire regimes were frequent and nonlethal, that these stands were open and dominated by large well-spaced trees, and that fuel amounts determine fire severity are not supported by science (see for example Baker and Williams 2015, Williams and Baker 2014, Baker et al. 2006, Pierce et al. 2004, Baker and Ehle 2001, Sherriff et al. 2014). (81-194)

Response: The vegetation response units used to describe historic and existing conditions within the project area acknowledge natural fire regimes occurred across a range of return intervals and severities (see Silviculture Specialist Report, PF-SILV-001, pages 7-14).

Comment 5v.06. The DEIS uses the word "resilient" or "resilience" in terms of how the action alternatives are responding to desired conditions by increasing the resilience of the ecosystem. The DEIS provides no operational definition of resilience that would allow for actual measurement of resilience as currently existing or to measure change following project activities. (81-196)

Response: Forest Service Manual 2020 defines resilience as the ability of an ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.

Comment 5v.07. The term "resilience" as used in the DEIS is invalid, rendering much of the analysis confusing and misleading. The DEIS gives the impression that resiliency only occurs following management through vegetation treatments and thus implies that resiliency does not occur without management. (81-197)
Response: The Silviculture Specialist Report (PF-SILV-001, pages 24-26) discusses resiliency in the context of current and projected forest stand conditions in relation to disturbances in the absence of management activities proposed in this project.

Comment 5v.08. The purpose and need of the project is to "improve landscape resilience to disturbances such as …… and fire", but the process of commercial thinning goes against the best available science. Current scientific studies refute the idea that thinning will reduce the chance and spread of wildfires. Bradley et al 2016 (https://www.fs.usda.gov/treesearch/pubs/5603) has shown that the heavy thinning prescribed in the DEIS will exacerbate fire severity rather than reduce it. (92-2)

Response: The Silviculture Specialist Report (PF-SILV-001) discusses the rationale for prescribing thinning practices to address forest health issues (pages 15, 30-32) and fuel loading prior to prescribed fire (pages 16, 28).

Soils

Comment 5w.01. The construction of roads can cause erosion, particularly on steep slopes where the whole slope may become unstable and become subject to movement or landslides. (6-7, 28-6)

Response: Proposed routes for new road construction have been reviewed to identify potential issues including slope stability. Road construction on steep slopes will follow design criteria (such as full bench construction and end-hauling of excavated materials) and BMPs to maintain future road prism stability.

Comment 5w.02. Barren clear cut areas are prone to nutrient loss in the humus layer due to wind drift as there is no stabilizing vegetation, making the area vulnerable to erosion. (6-16)

Response: Harvest activities are required to meet Region 1 Soil Quality Standards. Displacement of organic materials and exposure of mineral soils cannot occur on more than 15% of the harvest area to maintain soil productivity.

Comment 5w.03. The number of new roads proposed in Alternative 2 and 3 is of concern as soils are susceptible to washouts as we saw in June 2017. (19-3, 116-14)

Response: Road construction for sale area haul routes will be required to meet BMPs that will install the necessary road drainage to minimize erosion and prevent washouts.

Comment 5w.04. A century of timber harvest and slash pile burning has depleted the soil carbon in our montane soils to levels where the soils have lost much ability to retain moisture. (51-1)

Response: See Region 1 Soil Quality Standards (PF-SOILS-002).

Comment 5w.05. Regeneration failure can be traced to loss of mycorrhizal fungi due to increased soil temperatures associated with vegetation removal. (51-2)

Response: See Region 1 Soil Quality Standards (PF-SOILS-002) and Jang, Dumroese, Keyes, 2016.

Comment 5w.06. We need to place a much higher value on the presence of soil organic matter in our local Rocky Mountain neighborhood, or face an ecosystem collapse analogous to the Dust Bowl of the 1930's because we have removed too much material from the soil side of the carbon cycle. (51-7)

Response: See Region 1 Soil Quality Standards (PF-SOILS-002).
Comment 5w.07. Harvest activities remove organic material that breaks down to form soil, creating a layer that insulates forest root systems from environmental extremes, fires, and insect and disease infestations. (65-2)

Response: See Region 1 Soil Quality Standards (PF-SOILS-002).

Comment 5w.08. Thinning should be conducted where needed to achieve results but as much organic material should be left on the forest floor as possible to nurture the soil and create a more fire resilient, drought tolerant forest. (65-3)

Response: See Region 1 Soil Quality Standards (PF-SOILS-002).

Comment 5w.09. Forest productivity is directly related to soil quality. Removal of wood fiber is spending the capital of forest productivity. (73-31)

Response: See Region 1 Soil Quality Standards (PF-SOILS-002) and PF-SOILS-001 pages 4 and 9-11.

Comment 5w.10. The DEIS fails to disclose that the Forest Service's Region 1 Soil Quality Standards are merely a mitigation of unavoidable soil damage, and have little basis in sustained yield or sustaining soil and land productivity. The DEIS fails to demonstrate compliance with the Soil Quality Standards, presenting numbers without providing a proper basis for their accuracy. (81-206)

Response: See Response 5w.19 and Soils specialist report (PF-SOILS-001).

Comment 5w.11. The DEIS provides no estimate of the degree of reduced soil productivity in the project area, except for an estimate of a limited category (detrimental soil disturbance) - but only if a site occurs in a unit proposed for logging. This view of the cumulative impacts on soils contradicts NEPA, Forest Service policy, and best available science. (81-207)

Response: See Region 1 Soil Quality Standards and soils analysis in PF-SOIL-001, and PF-SOIL-007.

Comment 5w.12. How does the DEIS account for the amount of detrimental soil disturbance in the terraced plantations proposed for mechanical thinning/fuels reduction? Has the terraced areas been evaluated as part of detrimental soil disturbance estimates? (81-208)


Comment 5w.13. Winter logging as proposed in the DEIS is only partially effective for mitigating logging damage. USDA Forest Service, 2005b states, "Monitoring of winter-logging soil effects conducted by the Forest Soil Scientist on the Bitterroot National Forest over the past 14 years has shown that 58% of the ground-based, winter-logged units failed to meet the R1 Soil Quality Standards. Winter logging resulted in an average of 16% detrimentally damaged soil." (81-211)

Response: Bitterroot NF monitoring of winter logging over the last 10 years has shown to create on average less than 5% detrimental soil disturbance. See PF-SOILS-006.

Comment 5w.14. Forest Service pledges to meet standards must be backed up with monitoring results based on reliable data. Units of the national forest system have monitored detrimental soil disturbance with very mixed results. For example, a recent Idaho Panhandle National Forest Forest Plan monitoring report (USDA Forest Service 2013a) revealed the relatively high frequency of violating the 15% standard. And in a report examining soil monitoring in national forests of the Northern Region, Reeves et al., 2011
also found mixed results on compliance with the soil quality standard 15% standard, with average detrimental soil disturbance for activity areas for some national forests over 15%. (81-212)


Comment 5w.15. USDA Forest Service, 2009c states in regards to project area sites where detrimental soil disturbance soils were not to be restored by active management: "For the …severely disturbed sites… "no action" …would create indirect negative impacts by missing an opportunity to actively restore damaged soils. The DEIS fails to disclose the locations where the Forest Service is creating indirect negative impacts by missing the opportunity to actively restore damaged soils outside of "activity areas." (81-214)

Response: The proposed action includes restoration treatments on roads and unauthorized OHV trails outside of vegetation management activity areas. See Master Table (PF-DATA-001) treatments.

Comment 5w.16. The DEIS does not disclose how detrimental soil disturbance estimates were calculated or indicate the intensity of soil surveys. (81-215)

Response: See PF-SOILS-001.

Comment 5w.17. The DEIS does not disclose that the soil quality standard methodology for "activity areas" inherently encourages "gerrymandering" areas not previously logged into project "activity areas," diluting the detrimental soil disturbance from previously logged units by creating a more favorable average. (81-216)

Response: See PF-SOILS-001 pages 1-2 and PF-SOILS-003.

Comment 5w.18. The DEIS does not disclose that the detrimental soil disturbance percent limit is based upon the amount of damage that is operationally feasible, instead of limits on actual land and soil productivity losses caused by detrimental soil disturbance. The soil quality standards were developed internally by the Forest Service without the use of any public process such as Forest Planning, NEPA, or independent scientific peer review. (81-217)

Response: The Bitterroot National Forest Plan adheres to the Regional soil quality guidelines to ensure soil resources are sustained. Soil properties including infiltration, water holding capacity, and filtering capabilities will be maintained if less than 15% of an activity area has been detrimentally disturbed. The Forest is bound by the Forest Plan Direction to “plan and conduct land management activities so that reductions of soil productivity potential caused by detrimental compaction, displacement, puddling, and severe burning are minimized” (BNF Forest Plan II.25 (7). This is being accomplished through project design, mitigations, and the implementation of BMP’s. BNF Forest Plan II-25(8) also states “Plan and conduct land management activities so that soil loss, accelerated surface erosion and mass wasting, caused by these activities, will not result in an unacceptable reduction in soil productivity and water quality”, again this is accomplished through project design, mitigations, and the implementation of BMP’s.

Powers et al. (2004) concludes that any standards await validation and will be updated as findings come in from research. Also, this is an issue being reviewed at the national level with assistance from the research community (S. Dehart and D Page-Dumroese, personal communication). There is literature to substantiate using the soil quality standards as surrogates for soil productivity (Page-Dumroese et al. 2000; Meurisse 1987; Powers 1990; Cline and Ragus 1998). Powers (1990) (PF-SOIL-030) cites that the rational for the 15 percent limit of change in soil bulk density...
is largely based on collective judgment. The FS estimates that a true productivity decline would need to be as great as 15% to detect change using current monitoring methods. Thus the soil-quality (threshold) standards are set to detect a decline in potential productivity of at least 15%. This does not mean that the FS tolerates productivity declines of up to 15%, but merely that it recognizes problems with detection limits. Also, a 15% increase in bulk density may not be detrimental to productivity; site and soil productivity depends on the soil and ecosystem in which it is found.

The 15 percent change in aerial extent realizes that timber harvest and other uses of the land result in some impacts and impairment which are unavoidable. This limit is based largely on what is physically possible, while achieving other resource management objectives. For example, 14 ft wide skid trails spaced 120 feet apart amounts to less than 10%. Conversely, uncontrolled skidding and machine piling can easily result in 30% or more of the area being detrimentally impacted. Application of the 15% aerial limit has been debated. Some Soil Scientists, for example retired Region 6 Soil Scientist Bob Mueresse feel “Applying the 15% aerial limit for detrimental damage is not correct, it was never the intent of the 15% limit and NFMA does not say that we can create up to 15% detrimental conditions, it says basically that we cannot create significant or permanent impairment, period.” How that works out in terms of practicality is the problem, it may be more appropriate to look at the overall effect of an impact on an area. For example, displacement of several small patches of ground may not be significant to overall productivity on a site whereas displacement of one or two large areas may be significant.

Comment 5w.19. Detrimental soil disturbance is merely a proxy for soil productivity. The DEIS presents no science to validate the Soil Quality Standard methodology for use as a soil productivity proxy. (81-218)

Response: See Response to Comment 5w.18.

Comment 5w.20. The Soil Quality Standard definition of detrimental soil disturbance considers only alterations to physical properties, but not chemical or biological properties. This is inconsistent with best available science. (81-219)


Comment 5w.21. The DEIS does not disclose levels of large woody debris within the project area following past management activities. (81-220)

Response: Coarse woody debris levels were quantified during silviculture stand examinations.

Comment 5w.22. NEPA requires that the Forest Service specify the effectiveness of its mitigations. (40 C.F.R. 1502.16.) The DEIS fails to specify the effectiveness of its mitigation of detrimental soil disturbance. The DEIS presents no quantitative monitoring data that demonstrates detrimental soil disturbance remediation activities have taken a Bitterroot National Forest activity area with detrimental soil disturbance amounts over the 15% limit to an amount that no longer violates the standard. (81-222)

Response: See PF-SOILS-006 and PF-WAT-019.

Comment 5w.23. The DEIS does not disclose the degree to which the productivity of the land and soil has been affected in the project area and forest-wide due to noxious weed infestations, and how that situation is expected to change in the coming years and decades. The Bitterroot National Forest's noxious weed treatment program is mitigation for management activities which exacerbate the spread of noxious weeds. The DEIS fails to disclose the effectiveness of this mitigation. (81-223)
Timber

**Comment 5x.01.** The number of cable logging acres is a concern. Consider using ground-based logging on slopes over 35%. New equipment has little impact on the environment and in many cases is less invasive than cable logging methods. (1-3)

**Response:** Ground-based logging is limited by the forest plan to slopes under 40%. Also, steep slope felling and processing equipment does not appear to be readily available in the area at this time.

**Comment 5x.02.** The sustained yield of the Bitterroot Forest does not provide enough fiber to support a local economically viable lumber mill. Therefore the timber is exported from the valley and supports fewer local jobs. Please limit the cost to the US government to $837,000 or less as detailed in alternative number 3. (31-5)

**Response:** Refer to page 2 of the Gold Butterfly economic analysis for discussion of where the project's timber may be processed.

**Comment 5x.03.** Please explain why timber harvest cannot be done using only existing roads. (36-67)

**Response:** Refer to page 23 of Chapter 2 in the F EIS for discussion on road construction in alternative 2. Alternative 3 was developed to only use the existing road system for vegetation management.

**Comment 5x.04.** We are concerned about the implementation of the prescribed "improvement cuts" planned for commercially treated units. Unless properly marked and monitored, the dangers of "high grading", "pickling", or "cull tree release" become significant. How is harvest monitored and supervised during and after completion? (38-7, 41-11, 74-5)

**Response:** The Forest Service timber sale contract is a legally binding contract with national and regional standards designed to ensure resource protection and to hold timber purchasers accountable to contract requirements. Various mechanisms in the timber sale contract ensure accountability for the cutting of designated timber. All methods of timber designation ensure that a sale administrator can determine whether the correct trees were cut after harvest has been completed. This can include Forest Service tracer paint on the stump, if the tree was marked with paint, or a description of stump diameter, species, and/or spacing. Forest Service sale administrators are trained and certified according to the direction in Forest Service Handbook 2409.15.

**Comment 5x.05.** The proposed road in unit 58a is located on very steep ground. Given the density of existing roads, steep topography, and predicted wolverine habitat in the area, the road should not be built. (45-21)

**Response:** Alternative 3 does not include the construction of any new roads including the one originally proposed in unit 58a under alternative 2.

**Comment 5x.06.** Quantify snag loss expected because of safety concerns which vary with different methods of log removal. (81-126)
Response: This is addressed in the snag habitat analysis found on page 18 of the Gold Butterfly wildlife report. It is acknowledged that snags may be lost due to potential hazardous conditions to field personnel. Snag retention requirements are described in the design features found in chapter 2 of the EIS.

Comment 5x.07. The road maintenance costs are not part of the Principle Net Value but the cost will be subtracted from the price of the sale, thus adding to the cost of the project. Provide full disclosure of the costs and discuss how contractors / sub-contractors will be responsible for which roads at what time. (92-23)

Response: As discussed in the Gold Butterfly economic analysis report, road maintenance in a timber sale contract is considered to be work that will be performed by the timber purchaser. This is work generally consists of maintaining proper drainage through blading or ditch cleaning, for instance, and is commensurate with use. The cost of this work is reflected in the present net value by a corresponding reduction in revenue which occurs when an appraisal allowance is made off the stumpage value of the sale. The economic analysis does not concern which contractors perform work on which roads, it concerns how much the work costs.

Comment 5x.08. Consider more "cut tree" marking as opposed to "leave tree" marking in units adjacent to roads to reduce visibility of marking paint to area users after project implementation. (96-3)

Response: The design features found in chapter 2 of the Gold Butterfly EIS require cut-tree marking in the vicinity of Gold Creek campground and Willow Creek trailhead to maintain the scenic integrity of the recreation sites. Given the steep topography adjacent to the roads in the project area, marking paint may not always be readily visible from the road. That being said, typically cut-tree marking is used when the number of trees to be cut is less than the number of trees to be left and leave-tree marking is used when the reverse is true. By choosing the method that requires the least amount of paint to be sprayed, the Forest Service can save substantial amounts of money during sale preparation.

Comment 5x.09. What specifications are written into logging contracts to assure contractors do not remove leave trees or move road lay outs? (74-5)

Response: The Forest Service timber sale contract is a legally binding contract with national and regional standards designed to ensure resource protection and to hold timber purchasers accountable to contract requirements. Various mechanisms in the timber sale contract ensure accountability for the cutting of designated timber. All methods of timber designation ensure that a sale administrator can determine whether the correct trees were cut after harvest has been completed. This can include Forest Service tracer paint on the stump, if the tree was marked with paint, or a description of stump diameter, species, and/or spacing. Timber theft is considered theft of government property and, if suspected, law enforcement is immediately notified. An investigation ensues and the purchaser may be penalized under the terms of the contract and/or criminal charges may be filed. Prior to constructing specified roads, clearing and construction limits are staked on the ground and specifications described in detail in the timber sale contract. Temporary roads are located by agreement between the purchaser and FS; location of temporary roads must be in compliance with the environmental document requirements.

Comment 5x.10. The FEIS should specify exactly what is going to be harvested and what is going to be left, with penalties for breaching the contract terms. (74-6)
Response: The Forest Service timber sale contract is a legally binding contract with national and regional standards designed to ensure resource protection and to hold timber purchasers accountable to contract requirements. Various mechanisms in the timber sale contract ensure accountability for the cutting of designated timber. All methods of timber designation ensure that a sale administrator can determine whether the correct trees were cut after harvest has been completed. This can include Forest Service tracer paint on the stump, if the tree was marked with paint, or a description of stump diameter, species, and/or spacing. Timber theft is considered theft of government property and, if suspected, law enforcement is immediately notified. An investigation ensues and the purchaser may be penalized under the terms of the contract and/or criminal charges may be filed. Forest Service sale administrators are trained and certified according to the direction in Forest Service Handbook 2409.15. For a description of the proposed silvicultural treatments, refer to chapter 2 of the FEIS.

Scenery

Comment 5y.01. Some proposed clearcuts and roads would be highly visible to areas west of the project and detrimental to the visuals and aesthetics of the area for both residents and tourists. (23-3, 40-35, 41-4, 43-9, 61-11, 81-249, 89-1, 116-15)

Response: An analysis of the scenery resource can be found in Scenery Specialist Report (PF-SCENERY-001) and design features (FEIS Chapter 2, Table 2.2-8) are also noted to ensure the proposed harvest units integrate with the natural landscape's patterns.

Comment 5y.02. The DEIS does not demonstrate the project activities would be consistent with the forest plan visual quality standards or explain how visual quality objectives were determined. (81-246)

Response: A detailed analysis of the scenic resource viewed from visually sensitive areas can be found in Scenery Specialist Report (PF-SCENERY-001). The visual quality objectives for the forest are set by the management area direction from the Bitterroot National Forest Management Plan.

Comment 5y.03. The DEIS fails to demonstrate how clearcuts will be consistent with Visual Quality Standard #2 and #3. (81-247, 92-33, 92-34)

Response: Bitterroot National Forest Management Plan Visual Standard #2, "opening created by timber harvest should be designed to blend with natural openings to the extent practical" is addressed through design features. Forest Plan Visual Standard #3, "the size, shape and location of the area between openings will be consistent with water, wildlife and visual resource considerations. Documentation of rationale and tradeoffs will be required if the proposed openings are larger than the intervening leave areas" is addressed through design features (FEIS Chapter 2, Table 2.2-8) as well as the scenery, hydrology, wildlife, silvicultural and timber resource reports.

Comment 5y.04. The DEIS does not present any analysis to determine impacts on scenery viewed from any visually sensitive area. (81-248)

Response: A detailed analysis of the scenic resource viewed from visually sensitive areas can be found in Scenery Specialist Report (PF-SCENERY-001).
Comment 5y.05. Has the Forest Service conducted post-project scenery monitoring to determine if past vegetation treatments conform to the Forest Plan or visual quality objectives? (81-250)

Response: Monitoring of projects post implementation does occur. The most recent monitoring report was completed in 2018 including scenic monitoring (see PF-SCENERY-004).

Wildlife

Comment 5z.01. Road construction, re-opening closed roads, associated log hauling, and other activities as proposed for this project will be detrimental to wolverine, lynx, elk, and other big game as well as other common and uncommon animals. (4-5, 6-4, 8-2, 19-6, 24-5, 28-6, 30-3, 34-2, 35-3, 36-49, 40-20, 56-2, 70-3, 71-2, 78-4, 83-12, 83-14, 88-1, 92-7, 113-2)

Response: The Wildlife Specialist Report (PF-WILD-001) evaluated the impacts of proposed actions on wildlife species and their habitats.

Comment 5z.02. Increased access to and visitor presence in the project area will impact sensitive wildlife species, such as wolverine. (25-3, 31-3, 114-9)

Response: The Wildlife Specialist Report (PF-WILD-001) evaluated the impacts of proposed actions on wildlife species and their habitats.

Comment 5z.03. The presence of existing roads and construction of new roads fragments wildlife habitat. (33-3, 61-5, 79-2, 83-2, 83-14, 111-2, 116-6)

Response: The Wildlife Specialist Report (PF-WILD-001) evaluated the impacts of proposed actions on wildlife species and their habitats.

Comment 5z.04. Proposed actions would fragment wildlife habitat, displace and kill species, disturb the feeding, nesting, and breeding of many species. Species impacted include flammulated owls, wolverine, western toads, pileated woodpeckers, marten, and possibly lynx, fisher, and grizzly bears. (36-48, 39-6, 40-19)

Response: The Wildlife Specialist Report (PF-WILD-001) evaluated the impacts of proposed actions on wildlife species and their habitats.

Comment 5z.05. Habitat and critical habitat areas for wolverine, lynx, fisher and pine martin share many areas where treatment of the forest or commercial logging overlap and shall have a substantial impact to various degrees on these declining and or struggling wildlife populations. (38-5)

Response: The Wildlife Specialist Report (PF-WILD-001) evaluated the impacts of proposed actions on wildlife species and their habitats. The project area does not contain designated critical habitat for any terrestrial wildlife species.

Comment 5z.06. Dwarf mistletoe infested trees are too valuable as wildlife habitat to be logged as proposed for this project. (40-33)

Response: Dwarf mistletoe brooms can provide habitat features for a number of wildlife species, including resting and hiding habitat for martens, fishers and red squirrels, and platforms that support Accipiter nests. However, those functions can also be provided by other types of habitat features such as cavities or large branches. It is likely that fire suppression and previous management have resulted in mistletoe infection rates outside the range of historic variability.
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(PF-SILV-001), which implies that wildlife species evolved with lower availability of mistletoe features than currently exists in the project area. While both proposed alternatives would harvest trees infected by mistletoe, many mistletoe-infected trees would remain in areas outside of commercial harvest units, and lightly infected trees will likely be left within some commercial harvest units. The large number of mistletoe-infected trees remaining within the project area would continue to provide the habitat features used by wildlife species, albeit at a reduced level.

Comment 5z.07. Logging old growth and constructing more roads will adversely affect wolverine. New research out of Alberta Canada (Scrafford—in Behavioral Ecology) indicates wolverines avoid roads—even lightly used roads. (40-39)

Response: The Wolverine subsection of the Wildlife Specialist Report (PF-WILD-001) disclose that land management activities (including timber harvest and road construction) and other human activities and developments are not expected to pose a threat to wolverines, based on findings in USDI Fish and Wildlife Service (2013). See also the Programmatic Biological Assessment for North American Wolverine (PF-WILD-058).

Scrafford et al. (2018) used GPS radio telemetry locations of 25 wolverines to determine that wolverines in their study area increase speed near roads and select against distances closer to roads. They suggested that “wolverines attempt to stay away from the immediate road corridor, where the risk of predation is likely greatest, with increased movement.” They hypothesized that “wolverines disproportionately rely on speed when there is risk from roads because strong avoidance would prohibitively increase the time needed to patrol their expansive home ranges in environments with abundant roads”. This indicates that roads are not barriers to wolverines, but that wolverines cross roads and move away from them quickly, and thus spend less time in the proximity of roads. They recommended that managers cluster roads on the landscape to reduce impacts to wolverines.

Most modeled wolverine habitat in the project area is in the Stony Mountain IRA. Most proposed road construction is outside modeled wolverine habitat, and is within already roaded areas. This generally follows the recommendation in Scrafford et al. (2018) to cluster roads on the landscape to mitigate the effects of roads to wolverines.

Comment 5z.08. If Alternative 2 is chosen, what buffers will be given to nesting territories of flammulated owls, pileated woodpeckers, barred owls, and great gray owls? (40-41)

Response: Snag retention guidelines that would protect many large snags are listed under the Wildlife design features in Table 2.2-8 of FEIS Chapter 2. Many known or suspected pileated woodpecker or flammulated owl nest trees are marked by wildlife tree signs. Design features to protect raptor nest areas are listed under the Wildlife design features of Table 2.2-8 in the FEIS. While we have documented barred owls and great grey owls in the project area, we have not identified specific nest trees or breeding territories for these species.

Comment 5z.09. Why not decommission and/or close roads to comply with the Forest Plan as it relates to elk habitat effectiveness rather than amend the Plan? (40-43)

Response: Closing roads to meet the EHE standard in every third order drainage in the project area would require closure of FSR 1302 (the Willow Mountain road) and FSR 364 (the Butterfly road), which would eliminate public access to popular destinations such as Willow Mountain Lookout, the Palisade Mountain National Recreation Trail trailhead, Burnt Fork Lake, and the Skalkaho Mountain trailhead. The Forest decided in the Bitterroot National Forest Travel
Comment 5z.10. Wolverines have been documented recently in the project area. The DEIS does not adequately ensure wolverine viability in the project area. (45-18)

Response: The Wolverine section of the Wildlife Specialist Report (P-WILD-001) discloses that land management activities (including timber harvest and road construction) and other human activities and developments are not expected to pose a threat to wolverines, based on findings in USDI Fish and Wildlife Service (2013). See also the Programmatic Biological Assessment for North American Wolverine (PF-WILD-058).

Comment 5z.11. Many units are located in mapped Canada lynx habitat that would require roads, log hauling, and logging activities. (78-7)

Response: Project effects to lynx and lynx habitat are analyzed in the Lynx section of the Wildlife Specialist Report (PF-WILD-001) and the Biological Assessment for Grizzly Bears and Canada Lynx (PF-WILD-004).

Comment 5z.12. The proposed activities, including clear-cuts, logging in old growth, and adding new forest road miles to the system will have significant adverse impacts to wildlife and wildlife habitat in the project area. The Forest Service must fully disclose the direct, indirect, and cumulative impacts to wildlife, wildlife habitat, and wildlife connectivity corridors. It fails to do so in this analysis. For example, under Alternative 2 the Forest Service proposes to cut permanent roads through at least 9 units of old growth and log these areas. These activities will harm the two documented flammulated owl areas in that old growth. (78-31)

Response: Project effects to wildlife and wildlife habitat are analyzed in the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.13. Activities proposed under the Gold Butterfly Project have the potential for substantial impacts on wildlife species, thereby threatening their viability. To comply with NFMA's viability and diversity protection requirements, 16 U.S.C. § 1604(g)(3)(B), the Forest Service must avoid any possibility of leading to a trend toward federal listing of species on the Bitterroot. The Forest Service must pay particular attention to avoid leading to a trend toward federal listing of wolverine, which is currently proposed for listing as threatened. Analysis at the population-scale and individual-scale is necessary. (78-39)

Response: The Wolverine section of the Wildlife Specialist Report discloses that land management activities (including timber harvest and road construction) and other human activities and developments are not expected to pose a threat to wolverines, based on findings in USDI Fish and Wildlife Service (2013). See also the Programmatic Biological Assessment for North American Wolverine (PF-WILD-058).

Comment 5z.14. The Forest Service also determined the project is not likely to adversely affect Canada lynx or grizzly bear (DEIS Chapter 3 at 67). The analysis supporting that determination is flawed because it ignores many impacts. (78-42)

Response: Project effects to Canada lynx and grizzly bear and their habitats were analyzed in the Wildlife Specialist Report (PF-WILD-001). The Forest documented the rationale supporting an effects determination of not likely to adversely affect for both species in the Biological
Assessment for Grizzly Bear and Canada Lynx (PF-WILD-004). USFWS concurred with these effects determinations (PF-WILD-096).

**Comment 5z.15.** The Forest Service downplays the project's impacts on wolverine. Under the Endangered Species Act, the Forest Service must confer with regard to impacts to wolverine. (78-43)

**Response:** The Wolverine section of the Wildlife Specialist Report (PF-WILD-001) discloses that land management activities (including timber harvest and road construction) and other human activities and developments are not expected to pose a threat to wolverines, based on findings in USDI Fish and Wildlife Service (2013). See also the Programmatic Biological Assessment for North American Wolverine (PF-WILD-058). There is no requirement under ESA to consult with USFWS on effects to species proposed for listing, which is the wolverine’s current status. If wolverines are listed as threatened prior to the conclusion of this project, the Forest would consult with USFWS on project effects to wolverines.

**Comment 5z.16.** The DEIS does not provide an analysis of how the spread of noxious weeds will impact wildlife habitat in old growth. (81-24)

**Response:** Project effects to the spread of noxious weeds are analyzed in the Invasives Specialist Report (PF-INVASIVES-001). Design features that will minimize the spread of noxious weeds are listed in the FEIS Chapter 2, Table 2.2-8.

**Comment 5z.17.** The DEIS's analysis and discussion of old growth is narrowly framed from a management perspective which has contributed to the situation where at least one old-growth associated species—the fisher—no longer has a viable population on the Forest. (81-25)

**Response:** Project effects to fishers and fisher habitat are analyzed in the Fisher section of the Wildlife Specialist Report (PF-WILD-001).

**Comment 5z.18.** Since old growth is likely below the historic range for the Forest and project area, then viability for old-growth associated species cannot be assured—especially in the context of more proposed logging of old growth. (81-38)

**Response:** Historic and current estimates of old growth percentages, as well as direct, indirect, and cumulative effects to several old growth associated species, are disclosed in the FEIS Chapter 3, Section 3.4 (Old Growth Treatment Effects on Wildlife) and in the Wildlife Specialist Report (PF-WILD-001). Wildlife species associated with old growth can and do occupy other forested structural stages. As a result, their viability may not be closely tied to old growth percentages.

**Comment 5z.19.** The DEIS states, "In some cases, the death of many or most of the larger trees in a stand reduces the number of large green trees to the point that the stand no longer qualifies as old growth under the regional old growth definitions (Green et al. 1992, errata 2005)." Please disclose where the Forest Plan provides protection or ecological recognition of the special wildlife habitat values exhibited by a former old growth stand having one or two too few large, old live trees to meet the criteria. (81-40)

**Response:** The Bitterroot National Forest Management Plan (USDA Forest Service 1987) addresses old growth under the Wildlife and Fish Resource Standards section on pages II-19 and 20.

**Comment 5z.20.** The Forest Service has not conducted research or monitoring comparing pre- and post-logging old growth occupancy by or abundance of the wildlife species with strong biological association with habitat components found in old growth. (81-47)

Comment 5z.21. In regards to snag numbers, the Forest Service considers them to be non-essential for old-growth designation. Forest Plan Wildlife and Fish Standard 3 states: "All snags that do not present an unacceptable safety risk will be retained." Is the Forest Service able to demonstrate it is managing consistent with this standard? (81-49)

Response: The snag-retention guidelines for this project are listed in FEIS Chapter 2, Table 2.2-8 under Wildlife design features and in the Wildlife Specialist Report (PF-WILD-001). See PF-WILD-097 for a discussion of how Fish and Wildlife Standard 3 relates to other Forest Plan standards that clearly allow salvage of dead trees.

Comment 5z.22. The DEIS does not cite any science or monitoring data to support its assumption that management will result in snags and down logs in abundance to support viable populations. What is the best available science the DEIS relies on for its snag retention guidelines? (81-52, 81-53)

Response: The science behind the snag-retention guidelines is disclosed in Section 3.7.2.C of the Wildlife Specialist Report (PF-WILD-001). The Wildlife Specialist Report (PF-WILD-001) disclose that snags are abundant across most of the project area, and likely exceed historic averages in many areas.

Comment 5z.23. The DEIS does not say how statistically robust the project area surveys are for making accurate estimates and analyses. For example, the DEIS states, "Snags are probably more abundant now on the Bitterroot National Forest than at any time since the Forest was created." The DEIS makes other forest-wide statements to support inadequate project area snag analysis, similarly unsupported by any data or discussion of cumulative impacts of logging, firewood gathering, roads, etc. (81-54)

Response: The Snags section of the Wildlife Specialist Report (PF-WILD-001) discloses that snag estimates in the project area were based on data from common stand exams. These data were gathered using formal stand exam protocols which have a corresponding statistical analysis. Forest-wide snag numbers are discussed in a qualitative manner based on the large number of acres burned by wildfires and the acres affected by insect outbreaks in recent years. These qualitative assessments are supported by quantitative estimates based on FIA data which is statistically rigorous. See the Snags section of the Wildlife Specialist Report (PF-WILD-001) and the Estimates of Old Growth and Snag Density on the Bitterroot National Forest (PF-WILD-019).

Comment 5z.24. In terms of "quality of habitat" the fragmentation of the Bitterroot NF is a major ongoing concern. It is documented that edge effects occur 10-30 meters into a forest tract (Wilcove et al., 1986). The size of blocks of interior forest that existed historically before management (including fire suppression) was initiated must be compared to the present condition. (81-55)

Response: The size of interior forest blocks that existed prior to management is not known. However, a number of studies cited in Sections 3.7.2 B and Q of the Wildlife Specialist Report (PF-WILD-001) document that western forests have become less fragmented, more homogenous and occupy a greater percentage of the landscape than historically. Indigenous wildlife species were adapted to frequent disturbance events and the resulting fragmented habitat conditions.

Comment 5z.25. The Forest Service fails to set meaningful thresholds and assumes without scientific basis that project-caused habitat losses will not threaten population viability. Of such analyses, Schultz
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(2010) concludes that "the lack of management thresholds allows small portions of habitat to be eliminated incrementally without any signal when the loss of habitat might constitute a significant cumulative impact." (81-83)

**Response:** The Wildlife Specialist Report (PF-WILD-001) evaluated the impacts of proposed actions on wildlife species and their habitats, including analyses of cumulative effects.

**Comment 5z.26.** The FS has not identified the best available science to make quantitative minimum viable population determinations for wildlife species on the Bitterroot NF. Assuring viability of most wildlife species is forest-wide issue. The cumulative effects of carrying out multiple projects simultaneously across a national forest makes it imperative that population viability be assessed at least at the forest-wide scale (Marcot and Murphy, 1992; also see Ruggiero et al., 1994a). The DEIS fails to consider and use the best available science and fails to insure population viability in violation of NFMA and additionally, violating NEPA's requirements that the Forest Service demonstrate scientific integrity. (81-84)

**Response:** The Wildlife Specialist Report (PF-WILD-001) evaluated the impacts of proposed actions on wildlife species and their habitats, including analyses of cumulative effects.

**Comment 5z.27.** The proposed project would impact the Burnt Fork-Willow and Willow-Skalkaho Lynx Analysis Units. With the proposed project, the Forest Service fails to consider, apply, and incorporate best available science and fails to demonstrate consistency with all Forest Plan/NRLMD direction, in violation of the Endangered Species Act. The project will result in unauthorized take as defined by Section 9 of the ESA. (81-85, 81-87)

**Response:** The lynx section of the Wildlife Specialist Report (PF-WILD-001) and the Biological Assessment for Grizzly Bear and Canada Lynx (PF-WILD-004) consider numerous recent scientific studies on lynx, and document that the project complies with NRLMD direction. USFWS concurred with the effects determination in the BA (PF-WILD-096). Incidental take of lynx in the form of harm resulting from habitat modification is authorized under the Incidental Take Statement in the Biological Opinion on the effects of the NRLMD (USDI Fish and Wildlife Service 2007).

**Comment 5z.28.** The DEIS does not include an analysis comparing the historic range of lynx habitat components with current conditions nor apply best available science regarding Canada lynx. (81-86, 81-88)

**Response:** The lynx section of the Wildlife Specialist Report (PF-WILD-001) and the Biological Assessment for Grizzly Bear and Canada Lynx (PF-WILD-004) consider numerous recent scientific studies on lynx.

**Comment 5z.29.** The DEIS and Forest Plan/NRLMD erroneously assume clearcutting/regeneration harvest have the same temporal effects as stand-replacing fire as far as lynx re-occupancy. (81-89)

**Response:** The Wildlife Specialist Report (PF-WILD-001) and the Biological Assessment for Grizzly Bear and Canada Lynx (PF-WILD-004) evaluated the impacts of proposed actions on lynx and their habitats. Addressing issues with the Bitterroot National Forest Management Plan or the Northern Region Lynx Management Direction (NRLMD) is beyond the scope of this project.

**Comment 5z.30.** The allowance of exemptions from Forest Plan direction is another issue of scientific controversy. The NRLMD allows for reduction of lynx foraging habitat within the wildland urban
interface. The problem with this approach is the boundary of the wildland urban interface is a changing geographical feature independent of Forest Service or U.S. Fish Wildlife Service influence. (81-91)

Response: Addressing issues with the NRLMD is beyond the scope of this project.

Comment 5z.31. The DEIS fails to analyze and disclose how much lynx habitat is affected by snowmobiles and other recreational activities. (81-92)

Response: The proposed action meets NRLMD Guideline HU-G11 because it does not expand designated over the snow routes or designated play areas outside baseline areas of consistent snow compaction. The Bitterroot Travel Management Planning Project (USDA Forest Service 2016) prohibited snowmobiling within the Stony Mountain IRA, which includes about 35,244 acres (64%) of the project area. Most of the lynx habitat within the project area is within the Stony Mountain IRA, and is thus unaffected by snowmobiles.

Comment 5z.32. The DEIS states that the project "May affect, but is unlikely to adversely affect" the Canada lynx. However the DEIS does not present adequate analysis of project activities' adverse effects on lynx, rendering any assumption of insignificance without sufficient analytical basis. (81-94)

Response: The Lynx section of the Wildlife Specialist Report (PF-WILD-001) and the Biological Assessment for Grizzly Bear and Canada Lynx (PF-WILD-004) consider numerous recent scientific studies on lynx, and document that the project complies with NRLMD direction. USFWS concurred with the effects determination in the BA (PR-WILD-096).

Comment 5z.33. The DEIS fails to explain how the wolverine habitat model is applied consistent with best available science. (81-96)

Response: The Wolverine section of the Wildlife Specialist Report (PF-WILD-001) contains an extensive summary of the best available science pertaining to wolverines, and describes the wolverine habitat model used in the analysis.

Comment 5z.34. The Forest Plan nor DEIS provide a description of the quantity and quality of habitat that is necessary to sustain the viability of the wolverine. (81-97)

Response: The Wolverine section of the Wildlife Specialist Report (PF-WILD-001) discloses characteristics of quality wolverine habitat, and the distribution of wolverine habitat in the northern Rocky Mountains. The Wolverine section of the Wildlife Specialist Report (PF-WILD-001) discloses that Hornocker and Hash (1981) concluded that in Montana, extensive wilderness habitat, coupled with more restrictive furbearer harvest regulations, should provide secure wolverine populations in the foreseeable future. The R1 Programmatic Biological Assessment for North American Wolverines (PF-WILD-050) concludes that the proposed action (typical Forest Service management activities) will not jeopardize the continued existence of the DPS of the North American wolverine.

Comment 5z.35. The DEIS states the action alternatives are "not likely to jeopardize wolverines across their range" but it fails to provide scientific basis for conducting a viability analysis "across their range." Cumulative effects are not adequately analyzed. (81-99)

Response: This effects call is appropriate because the project is consistent with the R1 Programmatic Biological Assessment for North American Wolverines (PF-WILD-050). The Programmatic BA considers the direct, indirect and cumulative effects to wolverines of typical Forest Service activities across the species’ range.
Comment 5z.36. The threatened grizzly bear is a resident species in the Sapphire Mountains, yet the Forest has not adopted non-discretionary habitat protection standards that match those found in other forest plans. The Forest Service has no scientifically robust conservation strategy for protecting the species and its habitat in the project area or Forest. (81-100)

Response: Montana Department of Fish, Wildlife and Parks does not have verified evidence that grizzly bears are a resident species in the Sapphires (J. Jonkel, MT FWP, pers. comm.). USFWS presumes that any grizzly bears that may be present on the Forest would be transient individuals. Project effects to grizzly bear and their habitat are analyzed in the Grizzly Bear section of the Wildlife Specialist Report (PF-WILD-001) and the Biological Assessment for Grizzly Bear and Canada Lynx (PF-WILD-004). Habitat protection standards and road density standards contained in other Forest Plans likely apply to occupied grizzly bear recovery zones, which do not occur on the BNF.

Comment 5z.37. What is the scientific basis for the statement, "the Gold Butterfly project area …is an appropriate scale for a grizzly bear analysis unit"? Then again, the DEIS hedges, stating "The defined cumulative effects area for grizzly bears is the BNF portion of the Sapphire Mountains north of the East Fork Bitterroot River (PF-WILD-043)." (81-101)

Response: The rationale supporting the use of the project area as an appropriate analysis area for grizzly bears is contained in Section 3.3.1 of the Biological Assessment for Grizzly Bears and Canada Lynx (PF-WILD-004).

Comment 5z.38. The DEIS fails to conduct the proper analysis of total road density and its open road density calculations incorrectly ignore undetermined roads which are presently accessible. (81-102)

Response: Road density calculations for grizzly bear are disclosed in Section 3.7.2 E of the Wildlife Specialist Report (PF-WILD-001) and the Biological Assessment for Grizzly Bears and Canada Lynx (PF-WILD-004). Total road density is typically determined using a moving windows analysis for projects in grizzly bear recovery zones. This project utilized linear road density of open roads, which is more commonly used for analysis of projects outside recovery zones.

Comment 5z.39. The DEIS states that the project "May affect, but is unlikely to adversely affect" the grizzly bear. However the DEIS does not present an adequate analysis of the significance of project activities' adverse effects on grizzly bears, rendering any assumption of insignificance without sufficient analytical basis. (81-104, 114-12)

Response: Project effects to grizzly bears and their habitat are analyzed in Section 3.7.2 E of the Wildlife Specialist Report (PF-WILD-001) and the Biological Assessment for Grizzly Bears and Canada Lynx (PF-WILD-004). The Forest documented the rationale supporting an effects determination of not likely to adversely affect for grizzly bears in the Biological Assessment for Grizzly Bears and Canada Lynx (PF-WILD-004). USFWS concurred with this effects determination (PF-WILD-096).

Comment 5z.40. The DEIS indicates fisher have been detected in the project area, but has no reliable historic data on fisher populations. (81-105)

Response: Project effects to fishers and fisher habitat are analyzed in the Fisher section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.41. The DEIS states that forest-wide, the Bitterroot National Forest has 95% of the habitat necessary to maintain a minimum viable population of fisher. Yet the proposed logging would harvest up
to 2,880 acres of fisher habitat, and increase habitat fragmentation. The DEIS's cumulative effects analysis has no analysis of present vs. pre-management baseline habitat conditions. The implications of the loss of old growth due to project logging was not analyzed or disclosed for fisher. (81-106)

**Response:** Cumulative effects to fisher were disclosed in the Fisher section of the Wildlife Specialist Report (PF-WILD-001).

**Comment 5z.42.** The Gold Butterfly DEIS fails to adequately analyze the cumulative effects on fisher due to trapping or from use of the road and trail networks. (81-107)

**Response:** Cumulative effects to fisher were disclosed in the Fisher section of the Wildlife Specialist Report (PF-WILD-001) and include effects due to access provided by roads and trails such as trapping and disturbance. Effects to fishers of recreation and trapping access provided by forest roads and trails were disclosed in the FEIS for the Bitterroot National Forest Travel Management Planning Project (USDA Forest Service 2016, PF-WILD-098), which is incorporated by reference in the Wildlife Specialist Report cumulative effects discussion on fisher.

**Comment 5z.43.** The analysis for the fisher does not disclose the direct, indirect or cumulative impacts on important habitat components, such as snags, logs, foraging habitat configuration, connectivity, cover, prey species impacts, etc. (81-108)

**Response:** Project effects to fishers and fisher habitat are analyzed in the Fisher section of the Wildlife Specialist Report (PF-WILD-001).

**Comment 5z.44.** The DEIS does not disclose the Forest Service's strategy and best available science for insuring viable populations of the fisher, including limiting human access and therefore trapping. The DEIS cites no scientifically-based analysis on the spatial and structural requirements for fisher survival and successful reproduction. There is no sound, scientifically-based analysis for the Forest Plan or entire Forest comparing forest-wide conditions with habitat metrics required to insure fisher viability. (81-109)

**Response:** Project effects to fishers and fisher habitat are analyzed in the Fisher section of the Wildlife Specialist Report (PF-WILD-001).

**Comment 5z.45.** The DEIS fails to consider best available science for insuring viable populations of the pine marten, a species whose habitat is significantly altered by thinning and other active forest management. (81-110)

**Response:** Project effects to martens and marten habitat are analyzed in the Marten section of the Wildlife Specialist Report (PF-WILD-001).

**Comment 5z.46.** Alternative 2 would alter about 3,000 acres of marten habitat. The DEIS fails to conduct an analysis of the historic range of marten habitat on the Bitterroot National Forest, thus it also fails to conduct the proper cumulative effects analysis. (81-111)

**Response:** Cumulative effects to marten are analyzed in the Marten section of the Wildlife Specialist’s Report (PF-WILD-001).

**Comment 5z.47.** The DEIS does not disclose the quantity and quality of habitat necessary to sustain the viability of the marten. (81-112)

**Response:** Project effects to martens and marten habitat are analyzed in the Marten section of the Wildlife Specialist Report (PF-WILD-001). The quantity of habitat necessary to sustain marten viability is addressed in the Marten cumulative effects sections of that document.
Comment 5z.48. The DEIS indicates the proposed logging would deplete forest that provides habitat for species needing the kind of habitat features found in mature and old-growth forests, such as the pileated woodpecker. The DEIS discloses that Alternative 2 would alter 12% of high quality habitat that exists in the project area, and another 2,300 acres of moderate quality habitat. Since the average size of pileated woodpecker territories would increase, the Forest Service is obligated to analyze impacts on survivability of nestlings. It fails to do so. (81-113)

Response: Project effects to pileated woodpeckers and their habitat are analyzed in the Pileated Woodpecker section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.49. The DEIS states, "Pileated woodpeckers …live primarily in old growth habitat characterized by warm and dry habitat types. These are habitats that characteristically had low severity, high frequency or mixed severity fire (Bull and Jackson 1995)." Such a narrow habitat association misrepresents the biology of the species. (81-115)

Response: Project effects to pileated woodpeckers and their habitat are analyzed in the Pileated Woodpecker section of the Wildlife Specialist Report (PF-WILD-001). Suitable habitats discussed are not limited to old growth habitat characterized by warm and dry habitat types.

Comment 5z.50. "The defined cumulative effects area for pileated woodpeckers is the Bitterroot National Forest between Ambrose Creek and Skalkaho/Daly Creeks. This area totals about 96,338 acres of mostly forested habitat." Where is the scientific support for the DEIS's chosen cumulative effects analysis area for pileated woodpeckers? (81-117)

Response: Cumulative effects to pileated woodpeckers are disclosed in the Pileated Woodpecker section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.51. The DEIS does not disclose the Forest Service's strategy and best available science for insuring viable populations of the pileated woodpecker. (81-119)

Response: Pileated woodpecker viability is discussed in the Pileated Woodpecker section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.52. The pileated woodpecker's strong preference for trees of rather large diameter is not adequately considered in the Forest Plan. The Forest Service provides no commitments for leaving specific numbers and sizes of largest trees favored by many wildlife species. (81-120)

Response: Habitat preferences for pileated woodpeckers are disclosed in the Pileated Woodpecker section of the Wildlife Specialist Report (PF-WILD-001). Snag retention guidelines for the Gold Butterfly project are listed in the Wildlife design features of the FEIS Chapter 2, Table 2.2-8 and in the Snags section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.53. What is the scientific basis the Forest Plan snag retention guidelines? Were those guidelines based the range of historical conditions for snags on the Bitterroot National Forest? (81-122)

Response: Snag retention guidelines for the Gold Butterfly project are more comprehensive and up-to-date than those in the Forest Plan. The scientific basis for snag retention guidelines for the Gold Butterfly project are disclosed in the Snags section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.54. Recent scientific research reveals the inadequacy of the BNF's snag retention guidelines. For one example, Lorenz et al., 2015 state: Our findings suggest that higher densities of snags and other nest substrates should be provided for PCEs (primary cavity excavators) than generally
recommended, because past research studies likely overestimated the abundance of suitable nest sites and underestimated the number of snags required to sustain PCE populations. Accordingly, the felling or removal of snags for any purpose, including commercial salvage logging and home firewood gathering, should not be permitted where conservation and management of PCEs or SCUs (secondary cavity users) is a concern (Scott 1978, Hutto 2006). (81-123)

Response: Snag retention guidelines for the Gold Butterfly project are more comprehensive and up-to-date than those in the Forest Plan. The scientific basis for snag retention guidelines for the Gold Butterfly project are disclosed in the Snags section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.55. Lorenz et al. (2015) must be considered best available science to replace inadequate Forest Plan snag retention guidelines. (81-124)

Response: Snag retention guidelines for the Gold Butterfly project are more comprehensive and up-to-date than those in the Forest Plan. The scientific basis for snag retention guidelines for the Gold Butterfly project is disclosed in the Snags section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.56. The DEIS fails to quantify the cumulative snag loss in previously logged areas or subject to other management-caused snag loss such as road accessed firewood cutting. (81-125)

Response: Estimates of snag numbers in the project area and at the Forest scale are disclosed in the Snags section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.57. The DEIS does not cite any science or monitoring data to support its assumption that management will result in snags and down logs in abundance to continuously support viable populations. (81-127)

Response: The snags section of the Wildlife Specialist Report (PF-WILD-001) discloses estimates of snag abundance at the project and Forest scales based on statistically valid data collection protocols. The cumulative effects subsection of the snag section in the report references monitoring studies that showed that snags were left in excess of snag retention guidelines in timber sale units.

Comment 5z.58. No estimates of snags for the project area state how statistically robust the project area surveys are for making accurate estimates and analyses. (81-128)

Response: The Snags section of the Wildlife Specialist Report (PF-WILD-001) both disclose snag estimates for the project area and the entire BNF. Snag estimates at the project level were based on data collected during old growth exams, which are performed using Common Stand Exam protocols at randomly-selected points. These data are statistically valid. Snag estimates for the Forest are based on data collected during Forest Inventory and Analysis plots, and are statistically valid (PF-WILD-019).

Comment 5z.59. The DEIS fails to apply the best available science to describe the quantity and quality of habitat that is necessary to sustain the viability of the pileated woodpecker. (81-129)

Response: Pileated woodpecker viability is discussed in the Pileated Woodpecker section of the Wildlife Specialist Report (PF-WILD-001).
Comment 5z.60. The DEIS doesn't disclose the Forest Service's strategy and best available science for insuring viable populations of the northern goshawk, a species whose habitat is adversely affected by logging and other forest management. (81-130)

Response: Samson (2005) addressed the short-term viability of goshawks in Region 1, and concluded that short-term viability of goshawks across the Region is not an issue. A design feature for wildlife in FEIS Chapter 2, Table 2.2-8 addresses northern goshawk management through implementing recommendations in the Northern Goshawk Northern Region Overview (PF-WILD-098) in goshawk nest stands.

Comment 5z.61. The DEIS includes a design feature, "Implement recommendations in the Northern Goshawk Northern Region Overview in goshawk nest stands." However there is no indication the Forest Service has searched for goshawk nest stands in the project area. The Forest Service must utilize goshawk survey methodology consistent with the best available science. (81-131)

Response: The Forest implemented standard goshawk survey methodology using broadcast goshawk alarm calls and/or begging calls to solicit goshawk responses in the project area in several different years starting in 1996. These surveys resulted in a number of goshawk detections in different areas, but we were unsuccessful in finding any nests as a result of goshawk surveys.

Comment 5z.62. The Forest Plan and the DEIS fail to describe the quantity and quality of habitat necessary to sustain the viability of the northern goshawk. (81-132)

Response: Samson (2005) addressed the short-term viability of goshawks in Region 1, and concluded that short-term viability of goshawks across the Region is not an issue.

Comment 5z.63. A basic purpose of the Forest Service's management strategy is to negate the natural processes that the black-backed woodpecker biologically relies on; the emphasis in reducing the risk of stand loss due to stand density coupled with the increased risk of stand replacement fire events. Viability of black-backed woodpecker cannot be assured, if habitat suppression is a forest-wide policy. (81-133, 81-137)

Response: Viability of black-backed woodpeckers is addressed in the Black-backed Woodpecker section of the Wildlife Specialist Report (PF-WILD-001). This section documents that wildfires create new habitat for black-backed woodpeckers on the Bitterroot National Forest in many years despite fire suppression efforts.

Comment 5z.64. The action alternatives would "cause a minor reduction in the number of black-backed woodpeckers the project area is capable of supporting in the short term. Over the long term, this alternative would reduce the risk of a large, high-to-moderate intensity fire and intense beetle outbreaks, thereby reducing the availability of suitable habitat (snags) that would potentially attract and support large numbers of black-backed woodpeckers for several years." The significance of these effects (including risk to viability) cannot be determined in the absence of a forest-wide cumulative effects analysis of the BNF fire suppression policies. (81-134)

Response: Viability of black-backed woodpeckers is addressed in the Black-backed Woodpecker section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.65. The Forest Service fails to apply best available science in the analysis of impacts to black-backed woodpeckers. (81-135)

Response: Project effects to black-backed woodpeckers are disclosed in the Black-backed Woodpecker section of the Wildlife Specialist Report (PF-WILD-001).
Comment 5z.66. See the agency's Fire Science Brief, 2009, which states, "Hutto found that Black-backed Woodpeckers fared best on sites unharvested before fire and poorest in the heavily harvested sites", raising a concern about logging for forest restoration that is not addressed in the DEIS: How does pre-fire logging affect the future suitability of these forests to post-disturbance specialists? (81-136)


Comment 5z.67. The DEIS does not disclose the quantity and quality of habitat necessary to sustain the viability of the black-backed woodpecker. (81-138)

Response: Viability of black-backed woodpeckers is addressed in the Black-backed Woodpecker section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.68. The DEIS does not disclose the quantity and quality of habitat necessary to sustain the viability of the flammulated owl. (81-139)

Response: Viability of flammulated owl is addressed in the Flammulated Owl section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.69. The Forest Service has no scientifically-based viability strategy for western toads, no metrics for describing the quantity and quality of habitat need to assure viability, and no way of quantifying cumulative effects. (81-140)

Response: Direct, indirect and cumulative effects to western toads are disclosed in the Western Toad section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.70. The DEIS states, Alternative 2 "would not change the amount of suitable habitat for western toads within the Project Area..." However, suitable habitat is not defined. (81-141)

Response: Habitat associations of western toads are disclosed in the Western Toad section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.71. The DEIS does not consider the following science, "The critical factor in whether toads can exploit open habitats appears to be the presence of adequate retreat sites [refugia] where toads can escape predators and maintain water balance (Guscio et al. (2007))." (81-142)

Response: Habitat associations of western toads are disclosed in the Western Toad section of the Wildlife Specialist Report (PF-WILD-001). The Western Toad section of the Wildlife Specialist Report (PF-WILD-001) cite PF-WILD-067, which appears to be the study proposal that resulted in several publications including Guscio et al. (2007). Other publications (Bartelt et al. 2004, Bull 2006) cited extensively in the Western Toad section of the Wildlife Specialist Report (PF-WILD-001) discuss the western toad’s preference for open habitats and ability to travel long distances from breeding habitat, similar to Guscio et al. (2007). The quotation from Guscio et al. (2007) contained in this comment seems to be somewhat contradicted in the same paper by their finding that “Most observations (75%) were made away from retreat sites in vegetated or open microhabitats. Use of microhabitats was not significantly related to temperature measured at the time of observation”.

Comment 5z.72. The DEIS states that Alternatives 2 and 3 "May Impact Individuals or Habitat" but cites no reliable population numbers or trends for the project area or Bitterroot National Forest. (81-143)

Response: Population trends for western toads are discussed in the Western Toad section of the Wildlife Specialist Report (PF-WILD-001).
Comment 5z.73. The DEIS fails to describe the quantity and quality of habitat necessary to sustain the viability of the boreal toad, and has no explanation of FS methodology for measuring this habitat. (81-144)

Response: Habitat preferences of western toads are disclosed in the Western Toad section of the Wildlife Specialist Report (PF-WILD-001). Broader scale surveys for western toads were focused on breeding sites as disclosed in the Western Toad section of the Wildlife Specialist Report (PF-WILD-001). Toads are considered to be habitat generalists when it comes to upland, non-breeding habitats, so efforts to monitor population trends have focused on evaluating use of potential breeding sites as in Maxell (2004).

Comment 5z.74. DEIS contains insufficient analysis supporting its "no effects" conclusion for elk. Does the analysis for the elk also represent impacts on bighorn sheep? (81-145)

Response: Effects to elk and elk habitat are disclosed in the Elk section of the Wildlife Specialist Report (PF-WILD-001). The DEIS does not reach a conclusion that either action alternative would have no effect to elk. The elk analysis does not apply to bighorn sheep, which are not expected to occur in any treatment units as disclosed in Wildlife Specialist Report.

Comment 5z.75. The DEIS does not present an adequate quantitative or qualitative analysis of elk security and thermal cover. (81-146)

Response: Effects to elk thermal cover, elk habitat effectiveness and elk security are disclosed in the Elk section of the Wildlife Specialist Report (PF-WILD-001).

Comment 5z.76. The DEIS fails to analyze the tendency of elk to flee and stay away from public land because the security is better on private land. This affects crops on private land, which becomes an economic issue. The DEIS fails to analyze this issue. (81-233)

Response: The Elk section of the Wildlife Specialist Report (PF-WILD-001) both disclose the recent trend of elk spending more time on winter ranges, in many cases becoming essentially year-round residents on private lands.

Comment 5z.77. The proposed action is inconsistent with the Forest Plan standards for protecting elk security and habitat. (92-35)

Response: Lack of consistency with Forest Plan standards for elk habitat effectiveness (EHE) and winter range thermal cover is disclosed in the Elk section of the Wildlife Specialist Report (PF-WILD-001). There is no standard in the Forest Plan for elk security.

Comment 5z.78. Willow Creek is vital breeding ground for Monarch butterflies. Proposed actions will impact important butterfly habitat. (94-4)

Response: The interdisciplinary team is unaware of populations of milkweed plants within the project area that could provide breeding habitat for monarch butterflies. There are clusters of milkweed plants along the Willow Creek road on private land several miles west of the project area, but these would be unaffected by the project.

Comment 5z.79. An alternative to removing trees would be to girdle them allowing them to become snags, which have importance aspects for ecosystem and wildlife health. (65-5)

Response: Snag density criteria were developed to ensure an adequate amount of snags are left within treatment units to benefit snag-dependent wildlife. See Wildlife design features in Chapter 2, Table 2.2-8.
Response Category 6. Consideration of Literature Cited

Fisheries

Malison, R.L., and C.V. Baxter. 2010. The fire pulse: wildfire stimulates flux of aquatic prey to terrestrial habitats driving increases in riparian consumers. Canadian Journal of Fisheries and Aquatic Sciences 67: 570-579. In ponderosa pine and Douglas-fir forests of Idaho at 5-10 years post-fire, levels of aquatic insects emerging from streams were two and a half times greater in high-intensity fire areas than in unburned mature/old forest, and bats were nearly 5 times more abundant in riparian areas with high-intensity fire than in unburned mature/old forest.


Response: The fisheries analysis did not conclude that fire per se would have adverse effects to fishes. The analysis specifically documented the potential benefits to fishes from fire, including increased large woody debris inputs to streams and increased habitat complexity. The analysis likewise pointed out that sediment inputs resulting from wildfire may be less adverse than the effects of project-related road sediment, stating “Research indicates that the short-term pulse of sediment created by fire is clearly more favorable and tolerable for the fishery than the constant sediment inputs created by roads…” Likewise the analysis pointed out that the effects of landslides may less adverse to fishes than road sediment. Rather than stating that fire alone would adversely affect fish, the analysis concluded that the potential effects of high severity fire (increased sediment, reduced shade) combined with the sediment generated by project activities could create adverse cumulative effects.

Fire and Fuels

Bradley, C. M., C. T. Hanson, and D. A. DellaSala, 2016, Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States? Ecosphere 7(10):e01492. 10.1002/ecs2.1492. Reviewed 1500 fires larger than 1000 acres in the western US and found that decreasing fire intensity corresponded to increased forest protection (prohibitions on logging). It questions your (and HFRA’s—written by politicians, not scientists) whole premise.

Response: This paper assesses whether active management of forests results in lower fire severity. It concludes that areas that are protected from logging burn the least severe. The authors maintain allowing more wildfires to burn under safe conditions can be an effective restoration tool. The researchers also acknowledge they could not rule out that low-intensity management could decrease the occurrence high-severity fires.

Baker WL (2017) Restoring and managing low-severity fire in dry-forest landscapes of the western USA. PLoS ONE 12(2): e0172288. https://doi.org/10.1371/journal.pone.0172288. Frequent low severity fire rates have been overestimated in dry forests, meaning that understory shrubs and small trees could fully
recover between low severity fires. Therefore less restoration treatment (thinning) is needed before reintroduction of fire.

Baker, W.L., T.T. Veblen, and Sherriff, R.L. 2007. Fire, fuels and restoration of ponderosa pine Douglas-fir forests in the Rocky Mountains, USA. Journal of Biogeography, 34: 251-269. “Exclusion of fire has not clearly and uniformly increased fuels or shifted the fire type from low- to high-severity fires. However, logging and livestock grazing have increased tree densities and risk of high-severity fires in some areas. Restoration is likely to be most effective which seeks to (1) restore variability of fire, (2) reverse changes brought about by livestock grazing and logging, 3) ensure that degradation is not repeated."

Response: These two papers examine fire return intervals in in dry ponderosa pine and Douglas-fir ecosystems and the effects of fire exclusion to these systems. The 2017 paper concludes that the fire return interval is likely greater than 25 years (the current commonly used time period) depending on the location of the ecosystem. The 2007 paper discusses that grazing and past forest management activities have shaped fuels greater than fire exclusion. Both papers acknowledge there is still a need for restoration in these ecosystems, and depending on the current condition of the areas prescribed for treatment, options could include a more passive, prescribed fire only option or active options, such as thinning and re-introduction of fire.


Response: This paper recommends a variety of management practices to restore resilience to stands and landscapes including providing for open stands, age class diversity, and retention of fire-tolerant trees through a variety of mechanical and prescribed burning treatments. Projectwide conditions in the Gold Butterfly project area allow for a range of successional diversity. Treatments are not designed to convert every square inch of the project area to an open forest. The proposed vegetation management activities will treat approximately X percent of the project area, helping create a landscape with a diversity of stand conditions in various successional stages.

Williams, M.A., W.L. Baker. 2012b. Comparison of the higher-severity fire regime in historical (A.D. 1800s) and modern (A.D. 1984-2009) montane forests across 624,156 ha of the Colorado Front Range. Ecosystems 15: 832-847. Recent high severity fires in Ponderosa-Doug Fir forests in Colorado are not outside historical (1800s) averages.

Response: This paper is specific to the Front Range in Colorado. Steve Arno’s extensive work in the Bitterroot, cited in PF-FIRE-001, found an average fire-free interval of 11-16 years in ponderosa and Douglas-fir and 16-27 years in Douglas-fir, lodgepole pine dominated sites.

Response: This paper discusses fire severity over a 133 year period from 1880 to 2012. The time is divided into 3 groups early, middle, and late. In the discussion portion of the paper high severity fires did not increase over the 133 yr. period. During the middle 20th century fires were aggressively suppressed and the cooler summers and spring allowed for conditions to successfully suppress fires. “However, climate, topography and other factors also likely influence proportion burned with high severity (Cansler and McKenzie 2014).”


Response: This paper addresses the issue of climate change, either through carbon storage or CO2 emissions from logging. Campbell et al. examines the issue that wildfires may leave more carbon stored than mechanical fuel treatments. The paper concludes that fuel treatments do not have an additional benefit of increasing carbon storage.

The Gold Butterfly project is not a primary contributor of global greenhouse gas emissions nor is it similar to the primary human activities exerting negative pressure on the carbon sink that currently exists in U.S. forests, namely land use conversion. The affected forests will remain forests, not converted to other land uses, and long-term forest services and benefits will be maintained. In lieu of the ability to dramatically alter climatic trends (at least in the short term), and with the inherent uncertainty regarding what specific long-term climatic changes may be, treatments proposed in this project may be one of the best options to maintain intact, healthy, functioning forests that can provide for a variety of future resource and social needs.


Response: The paper discusses the reduced risk of high severity fire 5 to 60 years after MPB outbreak. We agree the reduced canopy bulk density as needles fall from the trees crown fire potential is reduced. Fire behavior it a combination of fuels, weather and topography.


Response: We agree with the article that once the crown bulk density is reduce fire severity is lessened for a time. As the dead trees fall and the understory grows creating ladder fuels allowing for fire to reach the overstory canopy crowning potential increases.

Response: The results of the article suggest thinning in lodgepole pine in the Greater Yellowstone area may reduce the probability of crown fire in the short term. The paper later discusses the effects for crown fire are linked to canopy bulk density. “The primary driver of crowning is canopy bulk density (Van Wagner 1977), and post-outbreak reduction of canopy fuels is the most likely mechanism of reduced probability of active crown fire in both red and gray-stage sites.” The stands over time do have more torching and crown fire potential due to tree growth in the understory. This increase in ladder fuels allow fire to burn into the overstory.

Insect and Disease

Hart, S.J., Schoennagel, T., Veblen, T.T., and Chapman, T.B., 2014, Area burned in the western United States is unaffected by recent mountain pine beetle outbreaks: Proceedings of the National Academy of Sciences (PNAS), v. 112, n. 14. Trees killed by mountain pine beetles have had no effect on the areas subsequent wildfires have burned.

Response: This paper addresses the debate of the effect of mountain pine beetle and wildfire activity. They conclude that both mountain beetle infestation and fire activity both independently increased due to recent warming and the area burned in the western United States is not in direct response to beetle activity. A purpose and need of the Gold Butterfly project is to increase resiliency to insects and disease and wildfire. We are not stating that one is dependent on the other.

Donato, D.C., B.J. Harvey, W.H. Romme, M. Simard, and M.G. Turner. 2013. Bark beetle effects on fuel profiles across a range of stand structures in Douglas-fir forests of Greater Yellowstone. Ecological Applications 23: 3-20. Fire potential is less, particularly for crown fires, after Doug Fir bark beetle mortality. Formerly dense DF forests became more open parklands, which is one of your goals.

Response: This paper highlights the importance of evaluating outbreak effects in the context of the wide structural variation inherent to many forest types in the absence of beetle disturbance. This supports the purpose and need of the Gold Butterfly project.

http://dnrc.mt.gov/divisions/forestry/docs/assistance/pests/conditions-highlights/2017_mcr.pdf. Shows that Mountain Pine Beetle and Doug Fir Bark Beetle are at endemic conditions.

Response: The Gold Butterfly project has stated throughout the analysis that the area is in endemic conditions for bark beetles, however, the analysis conducted shows that the area is in moderate to high hazard for bark beetles because of high basal areas and high tree densities.


Response: The paper published in 2014 raised public interest in forest management conducted by the USFS in response to bark beetle infestations occurring at that time. The paper raised questions regarding treatment efficacy of projects implemented for direct and indirect control of MPB. The points in the article argue against indiscriminate applications of direct and indirect MPB control treatments to halt severe and widespread MPB infestations. Points were also raised about the extensive application and efficacy of direct and indirect control treatments. While the issues discussed in the paper are appropriate, some of the conclusions are not applicable to conventional
management strategies implemented by the USFS. This is primarily because USFS treatments are not implemented to stop ongoing MPB infestations that are severe and widespread. Rather, USFS indirect control treatments are implemented prior to severe infestations to enhance tree survival and resilience to multiple disturbances. USFS direct control treatments are implemented as only one component of an integrated pest management strategy to provide short-term protection for high value trees.

The Gold Butterfly project is applying indirect control treatments designed to enhance tree survival to meet integrated resource objectives and promote forest resilience to multiple disturbances. Thinning and regeneration treatments are designed to reduce stand density and promote age-class, structure, and species diversity to reduce conditions susceptible to MPB infestations.


Response: The paper addresses change in the stand structure as overstory changed from largely lodgepole pine, a shade intolerant species, to predominantly Douglas-fir, a more tolerant species. Removal of the mature pine increased the rate of successional change towards a Douglas-fir dominated stand. The response is similar to some proposed treatments that reduce basal area and crown density to promote stand health and growth.

Carswell, C., 2016, Genetic research lays foundation for bold conservation strategies: High Country News, June 8, 2016. Pinyon pines susceptible to moths turn out to be the most drought resistant and survive over healthy appearing ones.

Response: Unable to locate article dated for June 8, 2016. An article by the same author and title dated June 8, 2015 is specific to Fremont and narrowleaf cottonwoods and Pinyon pine resistance to insect and drought stress. These tree species do not occur within the project area and would not be treated by the Gold Butterfly project.

McNulty, S.G., Boggs, J.L., and Sun, G., 2014. The rise of the mediocre forest: why chronically stressed trees may better survive extreme episodic climate variability: New Forests, v. 45, p. 403-415. Finds that the healthy looking trees are not the ones that best survive climate change due to slower growth and higher root to foliage ratios. You cannot select for adaptive trees; only nature can do that.

Response: The paper hypothesizes that as the duration, severity and interaction of stress becomes more pronounced under increasing climate variability, seemingly less healthy, chronically stressed trees could begin to survive environmental stress better than their traditionally considered healthy, non-chronically stressed tree counterparts. They further hypothesize that this shift in survivorship will be attributed to tree response to increasingly extreme climate variability at levels not previously observed in recorded history. Trees selected to be retained in the project area are selected on various criteria.

Hadfield, J.S., Mathiason, R.L., and Hawksworth, F.G., 2000, Douglas Fir Dwarf Mistletoe: Forest Insect and Disease Leaflet 54, USDA-FS, 10 p. Your own USFS pamphlet states "it is a pest only where it interferes with management objectives, such as timber production". In other areas, it is important for wildlife habitat. It also states that spread rates are faster in open stands than dense stands.
Gold Butterfly Project

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5187427.pdf  Gives strategies for management when commercial timber production is the goal.

Response: These papers discuss mistletoe and management of forests with mistletoe. The Gold Butterfly project does propose management activities to help manage mistletoe in the project area, however, the project was not designed to fully eradicate mistletoe from the project area. Treatments are intended to reduce mistletoe spread in selected units, many acres of the project area contain mistletoe that will remain untreated.

Silviculture

Nacify, C., Sala, A., Keeling, E.G., Graham, J., Deluca, T.H., 2010, Interactive effects of historical logging and fire exclusion on ponderosa pine forest structure in the northern Rockies Ecological Applications, 20(7), 2010, pp. 1851-1864. "Fire-excluded ponderosa pine forests of the northern Rocky Mountains logged prior to 1960 have much higher average stand density, greater homogeneity of stand structure, more standing dead trees and increased abundance of fire-intolerant trees than paired fire-excluded, unlogged counterparts. In other words, logging increases fuel loads and produces the densest forest over the long term.

Response: This paper discusses the effects of logging and fire exclusion in the northern Rocky Mountains. The conclusion of this paper shows that forests that were logged and had fire suppression are denser, less diverse, and less fire tolerant than similar unlogged and fire suppressed stands. The authors emphasize that forest health treatments should focus on stands that were previously logged and roaded and are located near communities. The majority of stands proposed for treatment in the Gold Butterfly project were harvested at some point in the past and are located within the WUI. Stands that are previously unlogged and fire-excluded may not require as of intense management prescriptions.

Wildlife


Response: Hutto (1995) surveyed recently burned areas in western Montana and northern Wyoming and determined that 15 bird species are generally more abundant in early post-fire communities than in any other major cover type occurring in the northern Rockies. He also stated that one species, the black-backed woodpecker, seems nearly restricted in its habitat distribution to standing dead forests created by stand-replacement fires. This paper was cited twice in the Black-backed Woodpecker section and twice in the Pileated Woodpecker section of the Wildlife Specialist’s Report (PF-WILD-001). It was cited once in the Pileated Woodpecker subsection, twice in the Forest Landbirds subsection and once in the Animal Movement, Migration, and Dispersal subsection in both the Wildlife section of the DEIS and the Wildlife Specialist’s Report (PF-WILD-001).
Response: Fisher et al. (2013) studied wolverines along the eastern edge of the Rocky Mountains north of Jasper, Alberta. In their study area, wolverines were more likely to occur in more topographically rugged terrain and areas where industrial activity and habitat alteration was low. They found weak evidence that occupancy varied with both ruggedness and seismic-line density. They found no evidence that wolverine occupancy varied with amount of regenerating area after timber harvest or fire. Although the mechanism was not entirely clear, they showed that the probability of wolverine occurrence decreased across a gradient of increasing anthropogenic landscape development.

Response: Scrafford et al. (2018) used GPS radiotelemetry locations of 25 wolverines to determine that wolverines in their study area increase speed near roads and select against distances closer to roads. They suggested that “wolverines attempt to stay away from the immediate road corridor, where the risk of predation is likely greatest, with increased movement.” They hypothesized that “wolverines disproportionally rely on speed when there is risk from roads because strong avoidance would prohibitively increase the time needed to patrol their expansive home ranges in environments with abundant roads”. This indicates that roads are not barriers to wolverines, but that wolverines cross roads and move away from them quickly, and thus spend less time in the proximity of roads. They recommended that managers cluster roads on the landscape to reduce impacts to wolverines.

Most modeled wolverine habitat in the project area is in the Stony Mountain IRA. Most proposed road construction is outside modeled wolverine habitat, and is within already roaded areas. This generally follows the recommendation in Scrafford et al. (2018) to cluster roads on the landscape to mitigate the effects of roads to wolverines.

Response: The objective of this study [Holbrook et al. (2018)] was to evaluate the spatial and temporal responses of lynx to several silvicultural treatments, including regeneration cuts, selection cuts and thinning. They found that lynx used silvicultural treatments post-harvest, but there was little use by lynx during the first 10 years following treatments. Thinning treatments required about 20 years post treatment to reach 50% lynx use, while regeneration and selection harvests required 34 years and 39 years, respectively, to reach 50% lynx use. Both the vegetation recovery time following silvicultural treatments and existing forest structures (presence or absence of lynx foraging stands) interacted to influence lynx behavior. Lynx tended to avoid silviculturally treated stands when preferred structural stages (e.g. mature multi-storied forest or advanced regeneration) were abundant in the adjacent landscape. In areas with low amounts of nearby mature forest, lynx use of recovering silvicultural treatments was higher than in treatments surrounded by an abundance of mature forest. Although the conclusions in Holbrook et al. (2018) do not directly address or contradict management direction provided by the NRLMD standards and guidelines, their findings do highlight the need to consider landscape-level compositions and
arrangements, as well as recovery times post treatment, when developing and analyzing vegetation management actions at the project level.


Response to Gold Butterfly Objection Review Officer’s Instruction Pertaining to FOB/AWR/WEG Objection Point on Kosterman (2014) Thesis

Kosterman (2014) found a relationship between forest structure and reproductive success in Canada lynx. However, the structural classes used in the Kosterman thesis are not the same as structural classes used to define and develop objectives, standards and guidelines in the Northern Rockies Lynx Management Direction [NRLMD] (USDA Forest Service 2007). Forest structural classes used in the NRLMD are based on structural stages defined by Oliver and Larson (1996), and do not “crosswalk” well with structural classes defined in Kosterman (2014). Thus, direct comparisons are difficult. Two examples are summarized below.

**VEG S1.** The 30% threshold value of an LAU in early stand initiation structural stage prescribed in NRLMD standard VEG S1, is not directly comparable to the 10-15% optimum level of young regenerating forest identified in the 2014 thesis. The 2014 thesis grouped vegetation into five categories, one of which was young regenerating forest. The calculation for the NRLMD VEG S1 standard threshold of 30% could include vegetation in at least three of the five vegetation categories described in the thesis, including: 1) open – trees not present; 2) thin forest; and, 3) young regenerating forest. Thus, the optimum 10-15% amount of young regenerating forest identified in the 2014 thesis appears to be a subset of the vegetation types used to calculate the 30% threshold standard in the NRLMD.

**VEG S6.** The greater than 50% mature forest optimum vegetation class described in the thesis is broadly defined as large trees with continuous canopy and no evidence of recent disturbance. This class could include a wide range of stand conditions, including mature stands of single-storied trees with little to no understory (stem exclusion structural stage), and mature stands of multi-storied trees with dense understories (MMS). The latter category provides the quality snowshoe hare habitat addressed by Standard VEG S6 in the NRLMD. The mature vegetation class in the thesis does not distinguish between single versus multi-storied mature forest structures and does not address understory horizontal cover metrics within lynx home ranges included in the study. Thus, the optimum 50% amount of mature forest identified in the 2014 thesis appears to include a large range of mature forest structural types that may or may not provide quality habitat for snowshoe hare. Until we better understand the actual structural makeup of those mature forest stands within the lynx home ranges, it is not currently possible to identify more desirable mature forest conditions within LAUs than what is currently provided in the NRLMD.

The NRLMD directs development and use of Lynx Analysis Units (LAUs) that represent a theoretical female lynx home range for implementing Standards and Guidelines in the NRLMD and for analyzing effects of management actions. LAUs approximate the size of a female lynx home range in the Northern Rockies (25 to 50 miles²) and contain at least 10 miles² of lynx habitat of subalpine fir/Engelmann spruce habitat types (Ruediger et al. 2000; USDA Forest Service 2007). Since LAUs represent theoretical female
lynx home ranges and are not the same as actual female home ranges and core use areas identified in Kosterman (2014), structural conditions that support reproductive success within female home ranges and core use areas are not directly comparable to structural conditions within LAUs used to address management guidance in the NRLMD.

The Bitterroot National Forest (BNF) is classified as both secondary and unoccupied lynx habitat in the NRLMD (USDA Forest Service 2007). The last verified records of lynx in Ravalli County include two animals documented by FWP trapping records in the winter of 1986-87. There are no known records documenting lynx reproduction in Ravalli County.

The revised Canada Lynx Conservation Assessment and Strategy [LCAS] (Interagency Lynx Biology Team 2013) stratifies its objectives and conservation measures by core areas and secondary/peripheral areas to help managers prioritize their conservation efforts. The conservation strategy in the revised LCAS indicates that secondary or peripheral areas (like the Bitterroot National Forest) might contribute to lynx persistence by supporting successful dispersal or exploratory movements, and lynx habitat in these areas appears to be inherently patchier and less productive. They further speculate that “the amount and quality of habitat required to support an independent adult or subadult disperser is less than is necessary to support reproduction and sustain a local population” (Ibid). The revised LCAS indicates that the focus of management in secondary areas is on “providing a mosaic of forest structure to support snowshoe hare prey resources for individual lynx that infrequently may move through or reside temporarily in the area” and that landscape connectivity should be maintained to allow for movement and dispersal (Ibid).

The BNF is classified as secondary, unoccupied habitat for lynx. As a result, it is likely that lynx using the BNF would be transient animals. It is unlikely that lynx would be able to successfully reproduce in large portions of the BNF due to the patchy, relatively unproductive nature of local lynx habitat. However, the Gold Butterfly project area does contain areas that provide more continuous lynx habitat than many other portions of the Forest. Kosterman (2014) suggested that female lynx home ranges consisting of >50% mature forest and approximately 10-15% young regenerating forest at both the home range and core area extents appear to be the optimal composition of forest structural types for lynx reproductive success.

The Wildlife Report (PF-WILD-001) displays structural stage percentages for both the existing condition and projected post-treatment conditions. As noted previously, the structural stage definitions used in the NRLMD and those in Kosterman (2014) are not directly comparable. However, using the assumption that the MMS structural stage in the NRLMD is equivalent to the mature forest type defined in Kosterman (2014), the amount of lynx habitat in the MMS stage in the Willow-Skalkaho LAU almost meets the >50% mature forest stage suggested by Kosterman (2014) in the existing condition, and declines slightly under each action alternative. The amount of lynx habitat in the MMS stage in the Burnt Fork-Willow LAU is about half the >50% mature forest stage suggested by Kosterman (2014) in the existing condition, and declines slightly under each action alternative. An unknown amount of lynx habitat classified as stem exclusion (SE) or Other in both LAUs in the Wildlife Report tables may also meet Kosterman’s broader definition for mature forest, which would increase those percentages. The existing percentage of early stand initiation (ESI) structural stage is higher in both LAUs than the 10-15% young regenerating forest suggested by Kosterman (2014), but ESI in the NRLMD also includes areas that Kosterman classified as open – trees not present and thin (or sparse) forest, and is therefore likely not
directly comparable to her young regenerating forest classification. The proposed treatments would decrease the percentage of MMS and increase the percentage of ESI slightly.

Based on the suggestions in Kosterman (2014), a female lynx in the project area would likely find adequate but perhaps not optimal habitat to promote reproductive success given either the existing condition or the post-treatment condition for either alternative in the Willow-Skalkaho LAU. A female lynx in the Burnt Fork-Willow LAU would be less likely to find adequate habitat to promote reproductive success because current lynx habitat percentages in the MMS stage and the ESI stage are further from the optimal habitat percentages suggested by Kosterman (2014). Proposed treatments would take these percentages further from optimal. However, both LAUs would continue to provide adequate lynx habitat to support successful dispersal or exploratory movements by lynx, and would continue to provide a mosaic of forest structure to support snowshoe hare prey resources for individual lynx that infrequently may move through or reside temporarily in the area. Landscape connectivity would be maintained to allow for lynx movement and dispersal. Therefore, the Gold Butterfly project area would continue to meet the objectives of the LCAS (Interagency Lynx Biology Team 2013) for lynx habitat in secondary or peripheral areas.