Appendix H. Response to Comments

ID	Commenter	Date Received
BS	B. Sachau	3/11/2008
SML	Steve Flynn, Sun Mountain Lumber	4/2/2008
USDI	Robert F. Stewart, USDI, Office of Envir. Policy and Compliance	4/15/2008
EPA	John F. Wardell - US EPA	4/17/2008
WW	Cameron Naficy - Wildwest Institute	4/21/2008
FWP	Mack Long - MT Fish, Wildlife & Parks	4/21/2008

Water Quality and Fish Habitat

Comment: Because Lolo Creek is listed as water quality impaired, "it is important that proposed management activities in the West Fork Butte Creek and South Fork Lolo Creek watershed be consistent with the Lolo Creek TMDL and Water Quality Plan being prepared by the Montana DEQ. (EPA, 1)

FS Response: The rehabilitative, restorative, and remediate portions of this project are all consistent with the Lolo Creek TMDL and Water Quality Plan (DEIS pages 161-162). Although these plans are not completely formulated, this project would complete several of the action items identified and would serve as one of several future projects necessary to address all requirements.

Comment: "The majority of the proposed road restoration work appears to be unfunded. Although it appears that overall net water quality improvements would still result from the funded road work…it would be helpful if the FEIS clarified that the overall net water quality improvements are based on work that is funded and can be carried out." (EPA, 2)

FS Response: The DEIS lists restorative and rehabilitative work that would be funded by the commercial component of the project and work that would be completed using other funding in Tables 51, 52, 53, Figure 4, and in the Road Maintenance and Improvements section on DEIS pages 150-158. Although the Butte Lookout project would not fund all rehabilitative and restorative work analyzed in the DEIS, this work will be done when other funding becomes available and this project is supporting the implementation of additional watershed restoration activities by including them in the planning effort, covering the necessary public scoping, and funding the environmental assessment that will enable future work to commence.

Comment: Consider additional road decommissioning within the project area; there is a clear need to carry out additional restoration of jammer roads. (EPA, 3)

FS Response: The interdisciplinary team systematically evaluated each road in the project area to determine the appropriate future management. All known jammer roads are mapped and assessed, and will be decommissioned using a variety of methods that are dependent on site specifics and potential future resource impacts (DEIS map, Appendix B, Document b-16 and Figure 7)

We may discover more jammer roads with additional field reconnaissance and project implementation. These roads would be evaluated in the same manner as known jammer roads to reduce short- and long-term impacts.

At this time, all roads not identified for closure or decommissioning are needed for future forest management. If there are jammer roads that are not identified in DEIS Appendix B, Document b-16 or DEIS Figure 7, please provide a map and we will update our information.

Comment: "The protection, improvement, and restoration of wetlands and riparian areas is a high priority…We recommend that harvest units be reviewed in the field to determine the presence of wetlands and identify wetlands on the Sale Area Map and in the field so that timber contractors will be able to avoid them." (EPA, 9)

FS Response: "Management Requirements" (DEIS page 25) provide protection to wetlands and riparian areas. During project layout, field personnel will identify wet areas and/or stream channels, and notify appropriate hydrology, fisheries, and botany specialists for special management requirements.

Comment: "It would be of interest to determine the actual water quality impacts from road restoration work. Perhaps there may be PACFISH/INFISH Biological Opinion monitoring sites in the project area that could be used to help evaluate actual project effects, or perhaps a monitoring station on South Fork Lolo Creek could be funded to allow some determination of the extent of potential water quality improvements." (EPA, 10)

FS Response: We plan to monitor the project work (DEIS Appendix D – Monitoring and Evaluation Plan), including road rehabilitation and restoration work, to assure that our assessment has properly predicted relative impacts and will result in a trend to substantively reduce the road infrastructure's influence on natural processes.

The Lolo NF uses the PACFISH/INFISH Biological Opinion (PIBO) monitoring data as much as possible. However, its application to Forest or project-scale activities is limited to the development of existing conditions for that particular site. The intent of the PIBO data is to determine the effectiveness of the PACFISH/INFISH streamside buffers and standard/guides at the Columbia River Basin scale. Due to the large scale it is difficult to use the effectiveness data at a local setting so we rely on the accumulation of the data at the scale it was intended to determine the effectiveness of PACFISH/INFISH.

In response to using the stream monitoring sites and methods as the preferred monitoring for 'actual' project effects, please refer to Reid and Furniss (2007) "Use of Regional Channel-based Indicators for Monitoring". From the experience and research of Reid and Furniss, as well as our own, the Monitoring and Evaluation Plan is set up to most accurately assess project influences by monitoring each activity as physically close to the activity as possible. Focusing the project monitoring efforts in this manner, allows us to avoid the multiple confounding variables that instream monitoring can produce, and the significant variables that some of the most rigorous research has difficulty identifying. We thus optimize our ability to assess direct project effects, which is supported by research completed by Hickenbottom (2001), Switalski et. al., (2004), and Makej (2001).

Comment: "How does this project meld with the longer term vision and goals laid out in the nearby Upper Lolo Watershed project?…We see watershed/fishery restoration of prime importance. We have particular concerns of the impact of further logging, log hauling, and road construction on bull trout and other native fisheries. Just because this road/culvert work may result in long-term benefit to fisheries and water quality does not mean that the impacts associated with the proposed logging and road construction and use are negligible, acceptable, necessary or unimportant. This is why we have earlier requested that the FS prepare an alternative which includes this type of restoration work without the commercial logging

component. It is disappointing that the FS has consistently refused to develop such an alternative in this and most of its project proposals." (WW, 8)

FS Response: Although this project is not in the same sub-watershed, and has no influence or association with the Upper Lolo Watershed Project, work relating to road remediation and the decommissioning methods and techniques are very similar, if not identical.

In the Butte Lookout project analysis, the effects of logging, log hauling, and road construction are addressed throughout the DEIS. In addition, Chapter 2 summarizes issues and Chapter 3 highlights the effects of these activities. The net result of these actions is beneficial to aquatic resources, and therefore acceptable.

The development of an alternative that excludes the commercial logging component is discussed in DEIS Chapter 2, pages 19 – 20 and more thoroughly addressed in FEIS Chapter 2, pages 20 - 23. There are three main reasons why this alternative was not considered in detail in the FEIS:

1. An alternative that excludes commercial logging would not adequately address the vegetation and fire components of the purpose and need. It would fail to improve vegetative conditions, increase the area's ecological resiliency to uncharacteristically large and intense disturbances, or maintain or improve wildlife habitat conditions.
2. Both action alternatives were designed to respond to the aquatic restoration needs within the project area by improving watershed conditions and aquatic habitat through road-associated work. The effects of implementing the proposed watershed and road-related activities are thoroughly discussed throughout the analysis of both action alternatives.
3. Historically, appropriated funding for watershed and road maintenance work has been limited. However, periodically new sources of funding become available, such as the Legacy Roads and Trails Remediation Initiative (LRRI) of 2008 and 2009.

   In addition to LRRI, other new funding sources may become available. The analysis includes the "as funded" types of restorative activities, along with the "funded", in preparation for future restoration when LRRI or other unknown funding becomes available.

Comment: "We question the general strategy of funding positive restoration work…with commercial timber sales that have negative or unknown impacts to the same project area where restoration is to occur...How much of the watershed restoration work proposed in the DEIS will be dependent on receipts from the timber sales associated with this project? Unless these positive aspects of the project can be guaranteed irrespective of timber sale receipts, they should not be included in the ecological cost-benefit effects analysis to offset, or justify, this project citing long term benefits to fisheries and water quality." (WW, 9)

FS Response: As discussed in the response to the comment above, an alternative that excludes commercial logging would not adequately address the vegetation and fire components of the purpose and need. It would fail to improve vegetative conditions, increase the area's ecological resiliency to uncharacteristically large and intense disturbances, or maintain or improve wildlife habitat conditions.

In addition, we prefer to use the proceeds from commercial timber harvest to fund rehabilitation and restoration work, and leverage funding for local efforts and economy (instead of returning it to the National Treasury).

Project work, associated funding, and the effects assessment relative to short- and long-term project funding, are specifically delineated and clarified in DEIS Tables 51, 52, 53, and Figure 4, and in the Road Maintenance and Improvements section of the DEIS pages 150-158.

Comment: "…it is disingenuous for the scoping notice to state that "The recently signed Upper Lolo Watershed Restoration Decision has addressed the sediment concerns" since funding for those restoration actions are not vigorously being sought, let alone secured by, the Lolo NF." (WW, 14)

FS Response: Due to limited budgets, it is often difficult to secure appropriated funding for watershed and road maintenance; however from 2006 to 2008 Lolo NF staff from various departments (e.g., Resources, Engineering, Fisheries, Hydrology, Budget, and Management), alone, and in working with partners, worked earnestly to fund over three-quarters of a million dollars in the reconnaissance, design, and implementation of the projects included in the Upper Lolo Watershed Restoration Decision. This work has been featured in several local media sources and is also displayed on our website.

Comment: "How much funding has the Lolo NF requested for restoration of vegetation that is not tied to timber sales? How much funding has the Lolo NF requested for other restoration such as road obliteration, culvert removals or replacements, etc. that is not tied to timber sales?" (WW, 18)

FS Response: Economics of the timber sale activities were addressed in Chapter 3 – Economics (DEIS pp. 233 – 240). Because timber markets declined between when the DEIS was published in March 2008 and the issuance of this FEIS, the economic analysis was updated in 2009 (FEIS pp. 231 - 239).

The Butte Lookout project analysis includes work that would be funded by the timber sale proceeds and work that would be funded by other means in the future.

Examples of restoration projects that have been implemented on the Lolo NF that were not funded by a timber sale include: road decommissioning (e.g., Deer Creek Road, Upper Lolo Decommissioning, Clearwater Road, and Dunham Road); culvert replacements (e.g., Hogback, Grizzly, Cottonwood, Surveyor, Eustache, and Cooper Creeks); and stream restoration (e.g., Savenac, West Fork Big, Deep, Eustache, St. Louis., Puyear, and Dunham Creeks).

Comment: "It is erroneous to assume that BMPs will assure water quality will be maintained, if present conditions are in many locations already in violation of the standards. The failure of BMPs is obviously implicated in the scientific literature (Beschta et. al. 2004)." (WW, 48)

FS Response: State BMPs in themselves are not a stand-alone restoration tools. That is why this project proposes practices beyond the basic BMP principles such as road narrowing, surfacing, and dust abatement prior to hauling timber. There are substantial gains in sediment reduction from existing roads when these types of practices are implemented (DEIS pages 154-155).

BMPs are sanctioned by the Montana Department of Environmental Quality, among other agency and industrial practices, and are in accordance with statues and guidance in the *Clean Water Act*. BMPs can be an effective tool to mitigate sediment created by timber haul.

In addition to applying BMPs to existing roads, we are also proposing culvert upgrades and road closures as part of the timber sale to further meet the intentions of the *Clean Water Act* and the *Endangered Species Act*.

Much of the haul route is behind a yearlong gate closure and would not be exposed to high traffic. The BMPs behind these gates would provide longer and better sediment control than BMPs on an open road system.

Comment: "The FS should always include an alternative that removes or fixes all the roads having design flaws, are otherwise contributing to soil and watershed problems, or are not needed for foreseeable management activities. The EIS must consider an alternative that gets the streams in the project area to meet RMOs. The public needs to know how much it costs to manage these watersheds up to acceptable conditions." (WW, 49)

FS Response: An alternative of this type was considered, but it does not fully fulfill the purpose and need for this project. During analysis, the interdisciplinary team systematically evaluated each road and did consider each road for design improvements, closure and/or decommissioning. All roads not identified for closure or decommissioning are necessary to meet forest management needs.

BMPs will be applied to these roads (DEIS Appendix A-4 and associated maps). Streams in the project area are largely functioning within reference conditions and RMOs are not a limiting factor (DEIS Chapter 3).

Relative to aquatic resources, the project addresses more formidable factors such as fine sediment deliveries and road-stream crossing replacements. The "As Funded" activities are also addressing potential risks of increased water yield and sedimentation associated with potential wildfire.

The proposed road decommissioning, stream crossing removal, and culvert upgrades on existing roads would reduce the potential effects from a wildfire. This is consistent with the Beschta et. al. (2004) literature and an effort to increase the inherent health of the West Fork Butte sub-watershed.

As with many forest management issues, the word "acceptable" for watershed management is very subjective and totally dependent on opinion. Therefore, we strive to balance all of the uses across the Forest, and for this area, timber and fuels management are planned outcomes.

Comment: "Please disclose how the watershed analysis relies upon an ECA (Equivalent Clearcut Acres) or similar modeling procedure. The FS's own research (King, 1989) is critical about the accuracy of a peakflow model, similar to the ECA method, in estimating increases in peakflows from logging and roads in nearby northern Idaho. King (1989) examined the veracity of a model for changes in peakflow as a function of ECA. He found that the ECA model consistently underestimated measured increases in flow caused by roads and logging." (WW, 52)

FS Response: The information included in the Project File on water yield assessment methods explains the modeling procedures in great detail. We added this information to Appendix F in the FEIS.

Pertinent to the King (1989) reference, tree removal can potentially increase water yields, including peak flows (DEIS Chapter 3). A thorough assessment of canopy reduction effects was conducted and is explained in detail in the Project File. Summarizing the findings, the Equivalent Clearcut Area (ECA) of the analysis area is 8.6%, which is well below values referenced by King (1989), Cheng (1989), and Burton (1997) having influences on peak flows.

Our findings are backed by this literature and field investigations (Chapter 3, Appendix F, and the Project File), and by placing runoff increases in context. Historic stand conditions where on

average, in a large watershed context, non-stocked and young tree ages accounted for nearly 39%.

With this literature as well as other scientific findings, the current open stand conditions are well below natural conditions, and a stronger argument could be made that flows, including peak flows, are less than what they would be naturally in this watershed (with corresponding consequences to fluvial functions, RMOs, habitat maintenance and creation, base flow discharges, and other factors). All of these factors and conditions would be benefited by opening up more stand acreage.

Comment: "The ECA model outputs are also inadequate to disclose the effects of the alternatives and cumulative effects on peakflows and resultant impacts on aquatic resources, because the model estimates changes in <u>average monthly</u> peakflow caused by logging and roads. King (1989) clearly noted that estimates of average monthly peakflows triggered by logging and roads are not adequate for estimating likely changes in channel conditions and sediment transport caused by logging and roads." (WW, 53)

FS Response: This question is addressed in the Project File, and an added comprehensive discussion in Appendix F of the FEIS.

ECA, as used for this project, is a very relevant and valid indicator of potential impacts. King (1989) provides valuable information; however, using this research in this manner is not appropriate for this assessment. King (1989) did, indeed, find that actual values generated by the Equivalent Clearcut Acres (ECA) procedure varied from those measured in the Horse Creek administrative-research site.

The Butte Lookout assessment did not use the ECA procedure in the way described in the article (i.e., no monthly peakflow calculations were made, nor were any presented). Moreover, characterizing existing and historic stand ages is very critical to characterizing and assessing watershed processes, which was out of scope of Dr. King's research.

The Butte Lookout assessment uses ECA methodology to:

1. Serve as one of several indicators of potential stream flow regime alterations influenced by past and foreseeable activities.
2. Compare project alternatives.
3. Characterize harvesting and stand ages relative to historic stand compositions and ages.

Relevant to the King (1989) research cited, in general, watersheds having at least 25-30 % of their area in an Equivalent Clearcut condition are generally considered to have an increased likelihood of altered runoff regimes (see Project File and FEIS Appendix F for details).

In proper context the use of Dr. King's work relative to the Butte Lookout assessment procedures and findings, Dr. King (1989, page 6) noted that the "four watersheds that had road building and harvesting all had statistically significant increases in annual water yield", as well as observed increases in instantaneous peak flows and maximum daily flows, but where snowmelt was not already advanced by canopy opening. His research concluded that the watersheds showing stream flow alterations had ECA values of 25.0% to 36.6%, which corresponds well with the Butte Lookout interpretations of effects (see FEIS pages 125-165 and Appendix F for additional details).

Vegetation/Ecology

Comment: Logging cannot act as a surrogate for natural processes. The FS must "clearly enumerate the factors responsible for departures from historic conditions, demonstrate the nature of the changes,…and show how logging would serve to restore functionality, or a trend towards functionality, to important ecosystem components…restoring structure is not necessarily restoration, because effective restoration must ultimately restore the processes responsible for ecosystem function." (WW, 1)

FS Response: As supported by research and referenced within this analysis, commercial tree harvest can be used to partially restore conditions to those nearer the historic range of variability (HRV). Conditions of structure and composition created nearer to the HRV allow for the ecosystem to function in a manner nearer to the HRV.

The purpose and need section (page 2 of the DEIS) states, "Develop a diverse mix of vegetative composition and structure that will reduce the risk of significant bark beetle infestations and sustained high intensity wildfire". The DEIS expands upon the purpose and need on page 5 under the headings "Improve and maintain 'at risk' vegetative communities while providing commodity outputs to local communities" and "Improve vegetative conditions to increase the area's ecological resiliency to uncharacteristically large and intense disturbances".

DEIS pages 33-34 provides the regulatory and Forest Plan guidance regarding management of vegetation, which includes: "sustained yield of timber and other outputs at a level that will help support the economic structure of local communities and provide for regional and national needs"; "maintain land productivity"; and "implementation of the principles of integrated pest management…through sound silvicultural prescriptions".

The vegetative resource framework in developing the proposed action and purpose and need is founded within the natural composition, structure and disturbance regime of the ecosystem within this analysis. On pages 35 and 36 the DEIS presents the summarized management objectives and how active management influences the mix of three possible types of forest conditions: green, red, and black.

The DEIS quotes from findings of the South Fork Lolo Creek landscape-scale NFMA analysis that, "active management is needed for this area because fire suppression has had an effect on landscape components (largely fire groups 8 and 9) by preventing the occurrences of moderate and low severity fires as well as any high severity stand-replacing fires". The last paragraph of that section reads, "Ecological sustainability requires the restoration of process as well as structure (Stephenson 1999, Arno 1996). Fire regimes and stand structures interact and must be restored in an integrated way. Fire alone may be too imprecise or unsafe in many settings, so a combination of treatments may often be the safest and most certain restoration approach (Allen 2002)".

On pages 36 and 37 the DEIS cites findings from the South Fork of Lolo Creek Watershed Analysis and the Interior Columbia River Basin Assessment (ICRB) relative to the departure of existing conditions and historic conditions. The bulleted statements referenced at page 35 highlight how timber harvesting can be used as a tool to restore historic structure and composition. The closing paragraph cites findings of the ICRB as, "In response to the changes in regional and landscape conditions on the Upper Clark Fork ERU forests, the primary change in succession/disturbance regimes appears to have been a shift from a mix of moderate and accelerated cycles, to a mix of long and retrogressive cycles. There is a low probability of restoring native succession/disturbance regimes without a concurrent restoration of landscape structures, fuel conditions, and fire".

The DEIS discloses the natural composition, structure, and disturbance regimes on pages 37 through 42, which state, “The existing conditions of the vegetative resources are organized around the ecological environments depicted by vegetation response units (VRUs). As stated under “Analysis Methods”, above, these are combinations of habitat type groups and fire groups that contain plant communities and associated environments that respond similarly to disturbances and have similar ecological functions and environmental conditions. The VRUs do not change within the landscape. What changes, in a predictable fashion, is the composition and structure of plant species in a succession from one stage to another following a disturbance, or during periods of no disturbance within a VRU. In the following section each VRU is addressed in terms of its natural composition, structure and disturbance regime, and then in terms of the existing conditions within this analysis area along with a coarse filter evaluation and identification of rare elements. Each VRU is discussed in terms of existing condition, historic condition.”

Additional sections within the vegetative portion of DEIS Chapter 3 further discuss disturbance, risk, and function from the perspective of bark beetle (pages 44-46), seral conifer species identified as “species-at-risk” by the Northern Region (pages 46-47), and finally, the description of the target stands on pages 47-48. Here the DEIS states, “The common target stand objective is a forested environment with composition, structure, and processes similar to the historic conditions but that provide for reduced risk of intense wildfires, improved wildfire suppression, public and firefighter safety, and protection of private property, while providing for the broad range of other national forest resources”.

The environmental consequences section (DEIS pages 48-54) addresses the direct, indirect, and cumulative effects of the alternatives including the relationship to the natural composition, structure, and function of the vegetative resources.

Comment: “Historic composition, structure, and processes have not been shown to be greatly altered in any of the project area since no data are presented by the FS presents to show the nature and extent of the departures that have occurred due to fire suppression…only a small portion of the project area (VRU 2)…was likely affected by fire suppression. These areas are largely not the focus of the logging treatments”...Reducing fire risk in mixed severity fire regimes is not “commensurate with the natural ecology of the area and is not consistent with the FS’s goals to maintain or return to historical conditions.” (WW, 2)

FS Response: Please refer to previous FS response. The DEIS cites findings of the “Assessment of Ecosystem Components in the Interior Columbia River Basin and Portions of the Klamath and Great Basins”, and uses several other scientific references in discussing, by individual VRU, the fire regime and how fire suppression has altered the existing condition from the historic condition (DEIS pages 36-43).

Under VRU2 (DEIS page 39), “Stands in an open grown park-like structure are now relatively rare. Understory brush species tolerant of shade are more abundant, older, and provide less succulent browse. Shade-intolerant understory vegetation is diminishing. Bunch grasses have declined from shading and competition. The old-growth pine structure remains threatened and is dramatically reduced from the historic condition”.

Under VRU3 (DEIS page 40), “Much of the basic framework of species and structure is present but masked by in-growth and overstocking as a result of fire control. Douglas-fir composition is above historic levels. Insect and disease conditions are similar to that described in VRU2, with the additional threat of mountain pine beetle in pure stands of lodgepole pine and Douglas-fir beetle in Douglas-fir sawtimber.”

Under VRU4 (DEIS page 42), “The seedling and sapling stages are well-represented from natural and artificial regeneration associated with timber harvests on National Forest System and Plum Creek lands. The larger forest structures of mixed conifer stands are much denser from a lack of low intensity ground fires which would have occurred on as much as 60 percent of these VRUs. These events would have favored larch, ponderosa pine, and whitebark pine over fir and spruce, and thinned pole-sized stands. The increased stand density is favorable to dwarf mistletoe in larch and Douglas-fir, and root diseases especially in firs and spruce. Bark beetle and budworm risk for Douglas-fir is less in these higher elevations through overall risk has increased with reduced tree vigor and an increase in host species. Understory shrub species have generally decline in overall health. Many are important wildlife forage and are at risk of being lost as a landscape component. Mountain pine beetle risk in extensive areas of lodgepole pine is high and there is an ongoing epidemic.”

The purpose and need (DEIS page 2) explains the logic, “develop a diverse mix of vegetative composition and structure that will reduce the risk of significant bark beetle infestations and sustained high intensity wildfire” and the DEIS pages 33-36 includes regulatory requirements, Forest Plan guidance, and summarized management objectives to provide guidance.

Comment: “The DEIS is filled with unsubstantiated claims of the effects of fire exclusion on vegetation patterns, wildlife habitat, and ecosystem function. The FS must provide evidence that fire exclusion has had the effects it assumes it does”…The FS must provide evidence that the proposed treatments ”will result in improved condition class.” (WW, 3)

FS Response: Please refer to the previous discussions and the purpose and need (DEIS page 2), regulatory requirement, Forest Plan guidance and summarized objectives (DEIS pages 33-36), discussion of the natural composition, structure and disturbance regime by VRU (DEIS pages 36-42), successional stages depiction (DEIS page 42), and the environmental consequences narrative (DEIS pages 48-54).

Improved condition class is the condition nearer the historic condition, from the existing condition. The purpose and need is not solely dependent upon “the effects of fire exclusion” but rather the regulatory requirements and Forest Plan guidance stated at DEIS pages 33-36.

Comment: There is no scientific confirmation that the current beetle epidemic will put the forest at greater risk of high severity fire…This is especially true for lower elevation forests where pulses of dead fuels would be most likely to have a subsequent effect on fire behavior. There is, however, some literature that addresses this for higher elevation forests. Kulakowski and Veblen (2007) found that relative to areas unaffected by a previous beetle epidemic, wildfires did not burn more severely in areas that experienced heavy mortality and thus had elevated levels of dead and downed wood…A similar situation is likely the case for most of the project area.” (WW, 4)

FS Response: The beetle epidemic is one of a host of attributes contributing to wildfire spread and intensity. Live and dead fuels are composed of carbon, and carbon is fuel for wildfires. The present continuous canopies, ladder fuels, and debris are sufficient under suitable conditions of wind, humidity, and ambient temperature to yield a significant area of sustained crown fire.

Supporting science on how bark beetles can affect wildfires, Jenkins et. al. (2008) found that fire behavior varies within endemic, epidemic, and post-epidemic stands; and Kaufmann et. al. (2008) found there is considerable uncertainty about fire behavior following a mountain pine beetle epidemic.

In pure lodgepole pine forests, crown fires are possible both before an epidemic and after while needles are still on trees. Intense surface fires are possible after most dead trees have fallen to

the ground. The probabilities of such fires are uncertain, and more research is needed to learn in what ways and how long the fuels and fire environment are altered by the beetles.

Lynch et. al. (2006) found that the 1988 Yellowstone fires' burn patterns were not correlated with 5-year old mountain pine beetle outbreaks, but were dramatically influenced by 15-year old mountain pine beetle outbreaks. Page and Jenkin's (2007) results indicated that for surface fires, both rates of fire spread and fireline intensities were higher in the current epidemic stands than in the endemic stands owing to increases in the amounts of fine surface fuels. In the post-epidemic stands, rates of surface fire spread and fireline intensities were higher than in the endemic stands owing to decreased vegetative sheltering and its effect on mid-flame wind speed. Total heat release of surface fires, including postfrontal combustion, was also higher in the post-epidemic stands owing to heavy accumulations of large diameter fuels.

Comment: "Fuel reduction to protect communities isn't part of the purpose and need of this project so minimization of large wildfires to protect private landowners is appropriately outside the scope of this project. Therefore, the FS must show that the minimization of severe disturbance, which it appears to intend to do, relates to one of the existing purpose and need." (WW, 5)

FS Response: Protection of communities and other values at risk continues to be imperative. The purpose of this project includes developing "a diverse mix of vegetative composition and structure that will reduce the risk of significant bark beetle infestations and sustained high intensity wildfire…and reducing the risk of adjacent property damage from high intensity wildfire." (DEIS page 2)

Comment: "FS states on p.2 of the summary that "Past large fires and timber harvest have not changed the landscape vegetative pattern sufficiently to reduce the potential scale of this [insect] epidemic." How much forest within the upper Lolo Watershed has been logged previously on FS, state and Plum Creek land? If the logging of these thousands of acres has not changed vegetation patterns enough to effect the insect epidemic how would 1400+ acres more as proposed in this project make a difference?" (WW, 6)

FS Response: DEIS Appendix C discusses past activities in the project area. The 1,400 acres of proposed treatments would have a direct effect on the area treated. Please refer to the DEIS pages 49 through 51 for direct effects, and the DEIS statement, "Alternative 4 would provide direct reduction of bark beetle infestation or risk of future infestation of host trees on 1,353 acres (see Table 13). The remaining untreated high risk stands could potentially continue to contribute to the overall bark beetle population within the analysis area."

Comment: "Forest Health indicators listed on p. 12 exhibit serious flaws. The management indicators (used as measures of success) are arbitrary, i.e. there is no evidence that they actually measure what the FS states it is interested in attaining with this project (such as restoration, ecological integrity/functionality)." (WW, 7)

FS Response: The first of the three management indicators address bark beetle risk and are supported by the literature referenced. The objective is to reduce the risk of bark beetle infestations in lodgepole pine and ponderosa pine stands and the indicator is simply the area of reduced stand basal area and reduced host species composition. Please see DEIS Chapter 3 bark beetle risk discussions, including the guidance and objectives discussed on pages 33 through 42, 44 through 46, and the environmental consequences on pages 49 through 54.

The second management indicator for the objective to "improve forest health by increasing the representation of western larch and ponderosa pine" as indicated by the "acres with increased representation of western larch and ponderosa pine" is supported by a host of referenced

materials including the Northern Region Overview, Columbia River Basin documents, etc. The vegetative section of DEIS Chapter 3 addresses this; see guidance (pages 33 – 37); landscape conditions and functions (pages 37 - 42 and 46 – 48), and environmental consequences (pages 48 – 54).

The third management indicator uses the science and protocols established under the Fire Regime Condition Class national program in which the "improved condition class" is directly related to improving the structure, composition, and function of the landscape. The vegetative section of DEIS Chapter 3 addresses this; see guidance (pages 33 – 37); landscape conditions and functions (pages 37 - 42 and 46 – 48), and environmental consequences (pages 48 – 54).

Comment: "Any forest condition that is maintained through intense mechanical manipulation is not maintaining ecosystem function. We request detailed disclosure of the historical data used to arrive at your assumed "desired conditions." We don't believe the proposed management activities are designed to foster the *processes* that naturally shaped the ecosystem and resulted in a range of natural structural conditions, they are merely designed to recreate structural *conditions in a single point* in time that the FS considers "natural." Generally, past process regimes are better understood than past forest structure. The FS must factor in fire, insects, tree diseases, and other natural disturbances in specifying the structural conditions assumed to be representative of the present conditions." (WW, 10)

FS Response: The proposed harvest treatments are not "intense mechanical manipulation". They would remove only a portion of the understory, intermediate and co-dominant crown classes, which partly replicates a low intensity ground fire.

DEIS Chapter 3 provides detailed disclosure of the existing, historical "range" of conditions, and the target landscape conditions. The treatments proposed emulate ecological processes and partially restore composition, structure, and function as supported by the referenced science.

The approach is not a "static" view of a single point in time. Please see the Vegetation portion of Chapter 3 for discussions on how disturbances such as insects and fire regimes have been considered.

Comment: "The EIS must disclose the ecological or economic cumulative impacts of fire suppression. A true no-action alternative would involve no fire suppression activities, since there's never been adequate NEPA on the Lolo NF's fire suppression policy." (WW, 11)

FS Response: The adequacy of NEPA for the Lolo NF's suppression policy is beyond the scope of this analysis. However, the Lolo Land Management Plan was subject to NEPA. The management of areas identified includes direction for suppression and fuels treatment. The direction in the Forest Plan has been documented in the Forest Fire Management Plan and allows for suppression strategies that are accepted in all federal land management agencies.

Alternatives considered in the NEPA process have to be feasible and consistent with Forest Plan direction. A "no fire suppression" alternative would not be consistent with Forest Plan management direction for the project area.

Fire Management activities are consistent with direction in the Lolo National Forest Plan (1986) as discussed in DEIS Chapter 2 "Forest–Wide Management Direction, Management Area Standards". DEIS pages 189-190 summarize Management Area standards relevant to fire management.

The Management Area standards states, "wildfires will be confined, contained or controlled". The Lolo National Forest Fire Management Plan (2006-2007), which is Appendix X to the Lolo National Forest Plan (1986), identifies the land in this analysis area as Fire Management Unit-2

(FMU-2). A discussion of the area FMUs may be found on DEIS page 205. Each FMU has associated values and risk that determine the appropriate management response to wildfire. Active fire suppression will continue due to resource values and risk associated from wildfire, as stated in DEIS Appendix C, page C-15 “Reasonably Foreseeable Future Actions”.

Contain, Control, and Confinement strategies are all appropriate suppression actions on the Lolo NF. There are also areas identified on the Forest that allow for wildland fire use with approved plans.

Comment: FS contentions that potential insects and tree diseases are something to be concerned about ecologically runs counter to more enlightened thinking on such matters such as Harvey et al. 1994, which states that insect and disease organisms are a part of healthy ecosystems. (WW, 15)

FS Response: The “Risk of Bark Beetle Predation” section found on DEIS pages 44 through 46 addresses bark beetles as “causing elevated levels of tree mortality”. This mortality is placed in context of “host species size, presence, and stand density create high risk conditions beyond the historic range of variability”. Hagle (2000) is the primary source which also provides ecological roles of native forest insects and diseases.

The DEIS Chapter 3, Vegetation section and referenced literature describes the departure of the existing condition from the historic condition. In Chapter 2, the DEIS describes how the range of alternatives is developed to address the issues as well as the Purpose and Need. Again, in Chapter 3, the DEIS discloses the environmental effects of the alternatives and how well they meet the Purpose and Need. The vegetative treatments were developed in a public process and are responsive to Purpose and Need statements relating to reducing the potential for high severity fires, maintaining or improving forest health, reducing the risk of damage from insects and disease, and maintaining or improving wildlife habitat.

Comment: “Please disclose how much forest—including old growth and mature forest, by type and successional stage (i.e., strata), has been clearcut, salvaged, intermediate cut, thinned, etc. in the analysis area. Also disclose how much of each category would be cut per alternative.” (WW, 17)

FS Response: No old growth forests or individual old growth trees would be cut in this project. DEIS Appendix C “Past Actions” discusses the amount of past harvest in the analysis area, although the amount of past harvests by vegetative structure was not determined. See the Vegetation section of DEIS Chapter 3 for a discussion of the historic range of structures by VRU.

Comment: “Please disclose the names of all other past logging and burning projects (implemented since the original Forest Plan) whose analysis area(s) encompass the areas to be logged under this proposal. Please disclose if the FS has performed all of the monitoring and mitigation required or recommended in any NEPA documents, and the results of the monitoring. We request that the EIS include a map showing the locations of past logging and burning and that displayed the approximate year the activities occurred.” (WW, 19)

FS Response: DEIS Appendix C, Table C-2 on page C-5 provides a detailed summary of harvest by decade, timber sale, and treatment type and Table C-5 on page C-13 displays the amount of prescribed burning by decade in the analysis area. Appendix B map b-20 which shows the locations of past logging and burning by decade was added to the FEIS.

There is no requirement that a project disclose the results of all past monitoring in an area. The Forest Plan monitoring reports are the appropriate place to report Forest Plan project-specific

monitoring results. Monitoring has been conducted by a range of resource professionals in the project area. Examples of past monitoring within the project area include the following routine monitoring activities:

- Silvicultural prescriptions were written or reviewed by certified silviculturists to ensure incorporation of Lolo NF Forest Plan snag guidelines, stream protection guidelines, etc.
- Fuel treatment direction and objectives were specified in silvicultural prescriptions and site-specific burn plans were written for each unit. Monitoring by certified prescribed burning professionals occurred to assure accomplishment of fuel treatment targets and to assure prescribed burning met the intent of the silvicultural prescriptions.
- Prescribed burning followed approved burn plans and was monitored to assure every effort was made to achieve air quality standards and allow for good smoke dispersion.
- Regeneration harvests had monitoring as required in Forest Service handbook 2409.26b to assure successful tree regeneration.
- Road construction activities were monitored by an engineer contract inspector, timber sale administrator, or district road management coordinator.
- The timber sale administrator monitored harvest operations and road use during timber sales.

Comment: "The FS often makes a case for logging as a way to reduce insect and disease damage to timber stands. As far as we are aware, the FS has no empirical evidence to indicate its "treatments" for "forest health" decrease, rather than increase, the incidence of insects and diseases in the forest. Since the FS doesn't cite research that proves otherwise in its NEPA analyses, we can only conclude that "forest health" discussions are unscientific and biased toward logging as a "solution." Please consider the large body of research that indicates logging, roads, and other human caused disturbance promote the spread of tree diseases and insect infestation" (Smith, 1989; Goheen and Goheen, 1989; Edmonds et. al., 1989; Chavez, et. al., 1980; Wargo and Shaw, 1985; Roth, et. al., 1980; Filip, 1979; McDonald, et. al., 1987; Morrison and Mallett, 1996; Hansen, et. al., 1988; Hansen, 1978; Witcosky, et. al., 1986; Aho, et. al., 1987; Goheen and Hansen, 1993; Goheen, et, al., 1985). (WW, 74)

FS Response: Please refer to the host of literature cited in support of bark beetle risk reduction in Chapter 3.

Public Access/Road Management

Comment: Consider EPA's general recommendations regarding roads; including assuring that road maintenance (e.g., blading) be focused on reducing road surface erosion and sediment delivery from roads to streams. (EPA, 6)

FS Response: These recommendations reflect the normal procedures that we follow to assure that adequate mitigation is incorporated into all road-related activities including road construction, reconstruction, and maintenance. The proposed road construction would be located on flatter slopes near ridgelines far from sensitive aquatic resources. Where sensitive soils are encountered, gravel surfacing would be applied on long-term roads, and on short-term and temporary roads hauling activities would be controlled to prevent road surface degradation that could cause sediment production. Best Management Practices (BMPs) mitigation techniques would be applied as needed on any new or existing project roads to provide adequate control of road generated sediments (see DEIS pages 255 - 257).

Techniques employed during road maintenance blading are designed to reduce the risk of sediment transfer. These include road blading when the surface material has the appropriate moisture content to assure adequate soil particle cohesion; blading the surface material into temporary berms that can be redistributed across the surface rather than sidecasted, and using roller compaction when needed to promote fine particle cohesion after the blading is completed.

Comment: "Please discuss the road maintenance needs in the project area in relation to the resources impacted by poorly-maintained roads." (WW, 72)

FS Response: Road maintenance needs and improvements for all potential project roads are identified on DEIS pages 246 - 249. Most of the discussion focuses on the existing deficiencies in BMP implementation as it relates to sediment production and delivery to the aquatic resource. Appropriate BMPs and other mitigation techniques are identified that would address the existing maintenance deficiencies on the road system. These techniques include gravel surfacing, road surface drainage control structures, ditch relief culverts, constructing sediment traps, fill armoring below drainage structures, stabilizing culvert catch-basins, and controlling road drainage and sediment transfer at stream crossings.

Recreation

Comment: The proposed harvests would improve hunting opportunities within the handicapped hunting area by reducing tree density (i.e., sight distance) and improving the area for game animals. (USDI, 4)

FS Response: We agree.

Comment: "The EIS must disclose the complete picture of the entire spectrum of recreational use in the project area.´ (WW, 71)

FS Response: The existing spectrum of recreation use in the project area is described on DEIS pages 222-223. As discussed on these pages, the analysis area is used for a variety of predominantly dispersed recreation activities in addition to some developed activities. The developed activities in the analysis area are on the lower end of the developed recreation spectrum. There are no Forest Service system trails or campgrounds in the project area. The dispersed undeveloped activities include:

- big game and upland bird hunting
- firewood cutting
- wildlife watching
- driving for pleasure
- OHV use on and off system roads
- berry picking

The developed activities in the analysis area include:

- The West Fork Butte Lookout Cabin Rental, which is located on the west edge of the analysis area. The cabin generated $1,110 in revenue in 2007 and was occupied 37 nights at $30 / night (annual occupancy rate of 10%).
- Groomed Snowmobile Trails in the analysis area are groomed from November /December until spring thaw, depending on snowfall and include:
    - Elk Meadows / Spruce Creek Trail 3. Approximately 8 miles of this 31 mile snowmobile trail is in the analysis area.

- West Fork Butte / Elk Meadows NFSR Trail 8**.** Approximately 3 ½ miles of this trail goes through or next to units 44, 45 and 47 in both Alternatives 4 and 5.

- A snowmobile parking area is located at snowmobile Trail Junction R. Junction R is located at the intersection of NFSRs 451 and 2136.

The Missoula Ranger District handicapped hunting area is entirely within the analysis area. It includes roughly 20 miles of gated system roads in the Cooper Creek Area (NFSRs 2174, 2175, 16087, 16088, 17142, 17143, 17144 and 17171). The Missoula RD issued 52 disabled hunting permits in 2008. The season ran between Oct 26th and Nov. 25th. In addition, the gate was accessible to permittees for a preview week from Oct 12 through the 18th. At an estimated average of three days hunted per permit, handicapped hunters spent a total of 156 hunter days in this activity in 2008. A common comment from hunters is that the area is too thickly timbered which results in low hunter success.

Fire risk and fuel loads

Comment: "There is often a relationship between higher road density and increased human-caused fire occurrences. Reducing road density may also reduce risks of human-caused fires which would be important in an area with high fuels/fire risk and/or wildland-urban interface issues." (EPA, 5)

FS Response: We agree**.**

Comment: The "harvest of many large fire resistant trees could potentially increase fire risk by opening up the canopy and promoting more vigorous growth of underbrush and small diameter trees that would increase fuels and fire risk in subsequent years, contrary to the hazardous fuel and fire risk reduction aspects of the purpose and need. We encourage retention of as many large trees as possible." (EPA, 13)

FS Response: Trees 19 inches diameter at breast height (dbh) and larger are not planned for removal. (DEIS page 22 in "Management Requirements") These trees would only be designated for removal where required for the safe and efficient conduct of logging (e.g., for skid trails, landings, or roads that cannot be located elsewhere).

The effects of the treatments proposed in the action alternatives on fuel loads and fire risk are discussed on DEIS pages 199-204. Briefly the proposed treatments would "reduce future wildfire severity by reducing vertical and horizontal fuel continuity and affect wildfire behavior by reducing intense surface fire spread over the majority of the harvest unit areas….There would be a greatly reduced likelihood of crown fire development and sustained crown fire spread. Future low-intensity wildfire events would be less detrimental and more beneficial to forest health. The proposed treatments would collectively detour large-scale, severe wildfire spread over large portions of the project area."

Comment: In response to scientific concerns expressed in literature by McClelland (undated), Hutto (1995), Veblen (2003), and Baker and Ehle (2001) relative to the need to address processes rather than conditions and the limitations of fire history methodology, "we ask that the FS disclose what fire history methodology it uses, acknowledge the limitations of the fire history methodology, and disclose what project-area data it's relying upon." (WW, 12)

FS Response: The processes that created the current conditions in the analysis area are discussed on DEIS pages 191 through 193. The roles of natural fires historically, fire suppression, past timber management, and mountain pine beetle infestations are summarized in these pages. The treatments proposed in the Butte Lookout analysis would facilitate using prescribed fire over portions of the landscape. McClelland (undated) and Hutto (1995) advocate

fire as a key component for sustained viability. Prescribed burning would enhance ecological biodiversity in a mosaic over the analysis area. DEIS Appendix B, document b-8 displays the analysis area's Historical Fire Regime and Occurrences. We agree with Veblen (2003) and Baker and Ehle (2001) that there are limitations to historical fire regime and fire occurrence data. Values are not absolute and land managers need to use discretion when interpreting the data.

Analysis area fire history is discussed on DEIS page 192 and Appendix C, page C-2. Fire history methodology includes evaluating age class information from inventory data, analysis of 1937 aerial photos, and Lolo NF fire statistics from 1996-2005. Analysis area fire history indicates large wildfire events occurred in 1889 and again in 1910. At mid-elevations, typical of the analysis area, the Lolo NF averages 55 wildfires per year burning 8,142 acres annually. Since the early 1900s there have been small wildfires but no large fire development in the analysis area.

Comment: Scientific data, such as that found in Graham, et. al. (1994, 1999), concluded that thinning can result in a faster fire spread than in unthinned stands. Since this scientific literature suggests that the proposed thinning activities will actually increase the rate of fire spread, the FS needs to reconcile such findings with the contradictory assumptions. (WW, 16)

FS Response: It is possible that untreated slash from thinning could contribute to a wildfire's rate of spread; the rate of spread is a function of what fuels are available to burn, weather conditions, and slope. These factors can be highly variable over time and space. Graham et. al. (1999) states that fire intensity in thinned stands is greatly reduced if thinning is accompanied by reducing the surface fuels generated by the cutting. This project would reduce the surface fuels generated by the cutting.

DEIS Appendix A Table A-1 displays the logging implementation for Alternatives 4 and 5, which shows that the majority of slash generated from harvest in this project would be removed from the unit by whole-tree-yarding. Tops, limbs and other nonmerchantable materials would be piled at the landing and removed. Additional surface fuel reduction would occur through prescribed underburning. Post-treatment residual slash configuration would be within the fuel parameters of the silvicultural prescription. Wildfire intensity would be reduced. Wildfire intensity reduction is stated in the Summary, Purpose and Need for Action section. A comparison of the potential wildfire intensity is discussed on DEIS pages 200 and 202 for pre-harvest, no harvest, and post-harvest conditions. Post-harvest wildfire intensity and flame length would be notably less than the anticipated condition, should no harvest occur.

Comment: "The EIS must explicitly state the funding mechanisms that would be used to carry out all the post-logging slash ("fuel") treatment. How certain would each funding source be, i.e., how likely is it that slash could remain untreated? Also, the EIS must state the expected time frame for treating all slash (nor for other "fuel" treatments, such as prescribed burning outside logged areas)." (WW, 47)

FS Response: The Economics section of the DEIS (page 239) states the treatment of logging slash and surface fuels would be funded from the sale of project timber. Other necessary funding mechanisms would be appropriated annually. Additionally, DEIS page 7 states that post-sale fuel treatment would likely be completed within 5 – 8 years following the publication of a Record of Decision depending on the time of sale offering and completion of contract obligations.

Air Quality

Comment: Prescribed burning creates particulate that has negative effects on human health. (BS, 1)

FS Response: The effects of the proposed treatments on air quality are discussed on DEIS pages 203-204.which state that all prescribed burn ignition would be managed in accordance with the Montana/Idaho Airshed Group, in conjunction with the Missoula County Health Department. This interagency organizational structure is in place to regulate prescribed burn ignitions to periods with favorable atmospheric dispersion which mitigates the potential smoke impact on human health. The potential impacts to Missoula residents are displayed in terms of particulate matter produced for PM 10 and PM 2.5 both for pre-harvest wildfire and post-harvest wildfire events in Tables 76 and 78 on DEIS pages 200 and 202.

Comment: "It is important to disclose that even though prescribed burns will be scheduled during periods of favorable meteorological conditions for smoke dispersal, the weather can change causing smoke not to disperse as intended…We recommend that notices be placed on the local newspaper at the beginning of each burn season, and additional efforts be made to contact residents near burns by telephone to make them aware of burns and potential air quality impacts." (EPA, 11)

FS Response: We agree. Prescribed burns planned on the Missoula Ranger District are submitted annually to Lolo NF Fire Management staff prior to the burn season and are distributed for public notice. When a prescribed burn is imminent, the District uses area media and a burn plan specific contact list for public notification. This media and localized notification is made a day or two prior to the planned ignition day.

Comment: "We encourage efforts be made to educate homeowners in the wildland-urban interface…regarding the need to use less flammable building materials and to manage vegetation near their homes." (EPA, 12)

FS Response: The Butte Lookout Project is not in the Wildland-Urban Interface (WUI); however the northern border is adjacent to the Lolo Creek WUI (DEIS page 189). The Missoula County Community Wildfire Protection Plan (2005) encourages hazardous fuel reduction on specified Federal lands adjacent to the WUI (DEIS page 190). The Lolo Creek WUI would most likely accrue a positive cumulative effect due to the reduced likelihood for large-scale severe wildfire impact (DEIS page 205). While fire-resistant construction materials and landscaping methods are not discussed in this analysis, the Lolo NF does participate in efforts to educate homeowners about practices to reduce their vulnerability to wildfire, and information is available through other sources such as www.firewise.org.

Soil Productivity

Comment: "It is important that BMPs and mitigation measures effectively protect soils and avoid sediment production and transport"...While some of these mitigation measures appear to be proposed, "we did not see all such measures identified for all summer tractor units…review proposed measures…to assure that all of the units with particularly sensitive soils or on landtypes with greater vulnerability or risk of detrimental soil disturbance…include adequate mitigation measures and/or less damaging harvest methods." (EPA, 7)

FS Response: Please refer to Table 57 on DEIS page 168 and the accompanying discussion in the paragraph just preceding the table. The paragraph preceding Table 57 explains how notations in the Lolo NF's Land Systems Inventory (LSI), the Forest's principle soil resource survey, such as "limitations" or "sensitivities" are tools to assist in designing harvest or other management prescriptions on the land. There is specific discussion of seven tractor units on "sensitive" landtypes and how they will be approached during harvest. A very important

consideration regarding units on “sensitive” landtypes is the sentence quoted from the LSI, “Slopes less than 35 percent are well-suited to tractor harvest.”

Comment: Unit 37 should be included among the units to receive post-harvest soil monitoring because it is stated to have an existing detrimental soil disturbance levels near the Regional threshold (i.e, Unit 37 has 14 percent and the threshold is 15 percent). (EPA, 8)

FS Response: Unit 37 is actually a skyline unit where projected final detrimental disturbance is 3 percent (see DEIS page 174, Table 68). There is a typo in the first paragraph on page 174 that “tractor Unit 27 and Skyline Unit 37” have calculated post-harvest detrimental disturbance of 14 percent. The text was corrected in the Final EIS to state, “tractor Unit 27 and skyline Unit 36” will have projected post-harvest disturbance of 14 percent.

There is accompanying discussion for both units 27 and 36 (as well as notations in Tables 67 and 68) that soil rehabilitation will occur in the units through the obliteration of old jammer roads. The discussion indicates the amount of reclamation would be sufficient to keep the units within the 15 percent soil quality threshold. Effectiveness monitoring of the reclamation will provide information to calculate a percent reduction in overall unit detrimental condition.

Comment: “The amount of detrimental soil disturbance would increase with the implementation of the proposal; therefore soil productivity would be reduced. Some activities, such as log landing construction and intensive log skidding would essentially permanently reduce the productivity of the soil on those sites directly affected. Will the FS utilize the services of a soil scientist on the ID Team?” (WW, 55)

FS Response: The amount of detrimental soil disturbance that would occur upon implementation of the Butte Lookout project is displayed and discussed on DEIS pages 165 – 177. Included in this “Environmental Consequences” section are tables displaying the existing condition of proposed units, the calculated increase as a result of the proposed activity and the total potential detrimental soil condition post-project. On a few units (27, 27A and 36) the combination of existing condition and projected increase approach the Northern Region threshold for maintaining soil productivity. In these units, specific soil reclamation is proposed and discussed. This reclamation, along with standard mitigation, would contribute to maintaining the units’ overall condition within the Regional standard. Log landings, skid trails and temporary roads are included in the calculation of a unit’s detrimental disturbance; see Tables 65 and 66 for examples.

On DEIS pages 158-162 discussion is provided linking the Northern Region threshold of 15 percent detrimental disturbance to maintaining soil productivity (page 159). References to scientific publications that accept the Northern Region procedure are cited in the text.

Further, two separate studies conducted on the Lolo NF are presented that, based on nearly 200 soil samples, demonstrate that detrimental disturbance is not a permanent condition. Monitoring harvest units logged by similar ground-based equipment found that the more elapsed time there has been since initial disturbance, the less residual detrimental disturbance could be detected. This is illustrated in Figures 5, 6 and 7 (DEIS pages 161 and 162).

Finally, the field studies, the analyses and the recommended mitigation and reclamation were all prepared by or overseen by the Forest Soil Scientist.

Comment: “…the scientific adequacy of the FS’s methodology for maintaining soil productivity on the Lolo NF has never been demonstrated. The FS’s determination that it may permanently damage the soil over that much area and still meet NMFA and planning regulations is arbitrary.

The EIS does not cite any scientific basis for adopting its percent numerical limits…the EIS must cite the results of soil productivity monitoring." (WW, 56)

FS Response: First, please see the responses to the previous comment. The "adequacy of the FS's methodology" is discussed starting on DEIS page 158 in the sub-section "Soil Productivity." This section traces the objectives of the Regional Soil Quality Standards back to the National Forest Management Act's requirement to manage National Forest lands, "without permanent impairment of land productivity and to maintain or improve soil quality." There then follows two pages of citations and quotations from published soil scientists attesting to the acceptability of using a soil quality threshold as an indicator of soil productivity protection.

Comment: "The only way for there to be any meaning to the numerical standards in cases where logging is proposed over previously disturbed soils and where activity area boundaries are not kept constant is if a qualified soil scientist actually performs site-specific field measurements to measure the existing percentages of detrimental soil disturbance within the already-established boundaries of activity areas, and within newly-established activity areas…the EIS must present "confidence intervals, standard deviations or standard errors in association with its conclusions" regarding the amount of activity area detrimental soil disturbance as well as all other resource impacts estimations or modeling." (WW, 58)

FS Response: The concerns expressed with regard to the conduct of "site-specific field measurements" is initially addressed on DEIS page 154 in the "Analysis Methods" section. The second paragraph of this section cites three references that document how field measurements were taken for the Butte Lookout project and how precision, consistency, and quality control of measurements are assured.

Then, on DEIS page 156 there is a several paragraph discussion of the rigorous training soil field crews go through to assure uniformity of observations. The last sentence in this section clearly states, "Sampling intensity within each unit provided no less than an 80 percent confidence level of detecting 15 percent detrimental disturbance within the area of the unit." This sampling intensity involves a process recommended by a research statistician of the Rocky Mountain Research Station, Moscow, Idaho, where much of the development of the Northern Region Soil Quality Monitoring Protocol was conducted.

Comment: "Please provide estimates of current detrimental disturbance in <u>all</u> previously established activity areas. The EIS must also discuss the link between current and cumulative soil disturbance in the Project Area to the impacts on water quantity and quality." (WW, 58)

FS Response: Please see DEIS pages 162-165, "Past Management in Proposed Activity Areas." Within this section, Tables 56-60 provide field-derived data as to the existing level of detrimental disturbance in all proposed activity areas in the Butte Lookout project. All proposed units were initially assessed by on-the-ground observations to confirm whether or not there had been previous activity in the unit. This determination is also recorded in Tables 56-60. For all units where evidence suggested previous activity, multi-point soil sampling transects were conducted to calculate the existing amount of detrimental disturbance. This procedure is fully described in the DEIS.

Comment: "The EIS must disclose the implications of all landtype limitations for detrimental soil impacts…The public must be able to tell which proposed activity areas fall into which landtypes, and therefore might be more at risk for erosion or other detrimental impacts that decrease soil productivity…the EIS must disclose the results of monitoring of past actions on these various landtypes, that would reveal the differential levels of soil impacts of the various logging activities carried out in the past (and now proposed with this new project)." (WW, 59)

FS Response: Please refer to Table 55 on DEIS page 157 and the accompanying discussion in the paragraph just preceding the table. The paragraph preceding Table 55 explains how notations in the Lolo Land Systems Inventory (LSI), the Forest's principle soil resource survey, such as "limitations" or "sensitivities" are tools to assist in designing harvest or other management prescriptions on the land. There is specific discussion of seven tractor units on "sensitive" landtypes and how they will be approached during harvest. All seven of these tractor units will be harvested in the winter so deep snow and/or frozen ground can "mitigate" surface disturbance (all management measures are discussed in DEIS Chapter 2). A very important consideration regarding units on "sensitive" landtypes is the sentence quoted from the LSI with respect to all these landtypes, "Slopes less than 35 percent are well-suited to tractor harvest."

Comment: "The EIS must disclose the locations and sizes of proposed log landings, which is important because of the extreme amount of soil and other disturbance that occurs on these sites—they will be essentially industrialized for the long-term, despite "mitigation."" (WW, 60)

FS Response: Log landing locations are estimated during project analysis. Final locations are based on final unit layout, areal distribution of volume to be harvested, specific capabilities of the harvest system, and unique terrain features.

Log landings are included as a component of harvest units that are subject to soil quality standards. For example, Table 65 (DEIS page 172) provides information on helicopter landings. The narrative in the paragraphs preceding Table 65 acknowledges that landings are "likely to be detrimentally disturbed throughout." The area of a landing in relation to the overall size of a unit is generally small and its contribution to the total amount of detrimental disturbance of a unit is likewise small. This is portrayed in Table 65.

Because of the concentration of activity at a landing, the primary "mitigation" is size limitation. After use, landing rehabilitation measures are applied. Compacted soils are loosened, the surface is re-shaped to provide drainage, any weeds are sprayed and erosion control seeding with woody debris placement completed.

Comment: "The EIS must measure or provide scientifically sound estimates of detrimental soil disturbance or soil productivity losses (erosion, compaction, displacement, noxious weed spread) attributable to off-road vehicle use." (WW, 61)

FS Response: The single access road into the Butte Lookout project area, FS Road 2174, is gated year-long at its junction with the "Elk Meadows Road" (FS Road 451). This vehicle restriction has been effective; no unlawful use, including off-road vehicles, has been detected.

Comment: The FS must, case-by-case, consider the cumulative effects of both past and proposed soil disturbances to assure that soil productivity will be maintained. (WW, 64)

FS Response: Soil cumulative effects are discussed on DEIS page 177. Unit specific cumulative effects are presented in Tables 67, 68 and 69 in the column, "Total Potential Soil Detrimental Condition."

Comment: "The EIS must disclose how the proposed project units would be consistent with Graham, et al., 1994 recommendations for fine and coarse woody debris, a necessary consideration for sustaining long-term soil productivity." (WW, 65)

FS Response: This concern is addressed on DEIS pages 169 and 170 in the sub-section "Organic Matter". Among other citations, this section refers to the Lolo National Forest Down Woody Material Guide (2006) which "contains specific recommendations and prescriptions for

coarse woody debris retention by forest type and other environmental features." This Down Woody Material Guide was developed based on Graham et. al. (1994) and other references.

Comment: "The FS does not have enough soil bulk density and other compaction monitoring data collected at the adequate soil depths and in enough sites on the Lolo NF to be able to make accurate predictions about the effects of soil compaction in project area activity areas." (WW, 66)

FS Response: Two Lolo NF documents cited in the DEIS, "Lolo NF Soil Characterization Assessments: 2006 Pre-Season Field Crew Training, Calibration and Standardization" and "Lolo NF Temporary Road Reclamation Effectiveness Monitoring Report" provide tables of bulk density values for about 300 individual soil samples. The field crew training document illustrates how bulk density measurements were used to help differentiate among soil disturbance classes when applying the Region One Soil Quality Monitoring Protocol. In terms of "other compaction monitoring", in the past three years several thousand soil observations for compaction have been carried out. At each sample point examined with the Region One protocol, an assessment of compaction and "soil platiness" to depths of 30 cm. is required.

To be clear, the comment focused on the Lolo NF's ability "to make accurate predictions about the effects of soil compaction in project area activity areas." The bulk density and compaction monitoring done by the Lolo NF has been to assess the presence of compaction or the degree of compaction <u>not</u> make predictions about the effects of soil compaction in project activity areas. The DEIS evaluates the soil effects based on the degree of overall detrimental soil disturbance and concluded that all activity areas will meet Regional Soil Quality Standards.

Comment: "Neither soil function nor soil quality have ever been monitored on the Lolo NF following management activities. This has long-term implications for sustained timber production as well as the ecological relationships in the soil upon which timber production so very much depends." (WW, 67)

FS Response: Post-harvest soil quality monitoring information is presented on DEIS pages 160-162 and graphically illustrated in Figures 5 through 7. In 2006 and 2007 over 300 previously harvested units were monitored for soil quality.

Comment: Please disclose if any documentation is available that responds to the Ecology Center's February 26, 2002 Freedom of Information Act request to the Northern Regional Forester regarding having performed validation monitoring of its 15% Standard. (WW, 68)

FS Response: The comment references Forest Management Handbook FSH 2509.18, Chapter 2 Soil Quality Monitoring, Section 2.1 (Exhibit 01 "Examples of Monitoring Types"). Section 2.1 deals with various types of monitoring. Sub-Section 2.13 defines validation monitoring:

> "Monitor to determine whether coefficients, requirements, standards, and guidelines are appropriate to maintain soil productivity. This monitoring is generally data intensive using techniques like permanent plots and is coordinated with Research. Data is used to establish base lines for soil properties to detect change over time and in setting threshold values."

All of the soil quality monitoring data collected on the Lolo NF has been entered into the SOLO database of the Rocky Mountain Research Station (RMRS), Forestry Sciences Laboratory in Moscow, Idaho. The RMRS is a participant in the Long-Term Soil Productivity (LTSP) project that is conducting research into such questions as the comment raises. Results from the first 10

years of this research, and much additional information is available at the LTSP website forest.moscowfsl.wsu.edu/smp/ltsp/index.html.

Comment: "…if the EIS cites mitigation measures it must cite the results of monitoring that prove such mitigation measures can reasonably be expected to be effective in protecting and maintaining soil productivity." (WW, 69)

FS Response: The data supporting the effectiveness of winter logging in reducing detrimental disturbance is presented on DEIS page 171 (Table 64). The effectiveness of ripping temporary roads to reduce soil compaction is discussed on page 174.

Comment: "The EIS must not simply rely upon Best Management Practices (BMPs) to base claims that soil productivity will be maintained following logging practices. BMP monitoring does not attempt to measure post-project soil productivity, since the audits are not scientifically designed to do so. Nor does it result in quantitative measures of detrimental disturbance, or soil productivity, which are the most relevant factors here." (WW, 70)

FS Response: The Butte Lookout DEIS does not only rely on Best Management Practices to base claims that soil productivity will be maintained.

The DEIS cites the Regional Soil Quality Standards whose intent is to maintain soil productivity by limiting detrimental soil disturbance (page 155). The DEIS provides the results of scientific studies that informed both the development of the Regional Soil Quality Standards and the Butte Lookout soils analysis (pages 158-162). The DEIS displays the results of Lolo NF soil monitoring that demonstrates a recovery over time trend in detrimental soil disturbance.

These data are numerous enough to conclude that detrimental disturbance is not a permanent state and that soils are not irreversibly damaged by short-term detrimental disturbance (DEIS pages 160-162). Table 64 on DEIS page 171 displays the effectiveness of "winter harvesting" as a means of lessening detrimental soil disturbance. Winter harvesting is then specifically prescribed for seven tractor units to minimize potential soil compaction (DEIS page 26). On DEIS page 174, soil rehabilitation techniques for de-compacting soils in old "jammer" roads found in Units 27, 27A and 36 are described. The effectiveness of this technique based on Lolo NF studies is also presented.

Wildlife and Old growth

Comment: Logging is harmful to wildlife. (BS, 2)

FS Response: Logging may have beneficial, detrimental, or benign impacts on wildlife species depending on the species in question and the logging treatment, timing, and methodology, etc. Effects on federally-listed species, regionally-sensitive species and management indicator species are discussed and documented in the DEIS pages 63 - 123 and also in the Biological Assessment for lynx which has been submitted to and concurred on by the U.S. Fish and Wildlife Service (Project File).

Comment: Actions proposed in the Preferred Alternative would likely have no adverse effect on species that might have been encountered by the Lewis and Clark Expedition." (USDI, 2)

FS Response: This is a true statement with some caveats. Actions in the Preferred Alternative have been analyzed for impacts on federally-listed species, regionally-sensitive species, and management indicator species. Effects are discussed and documented in the DEIS pages 63 - 123 and also in the Biological Assessment for lynx which has received a letter of concurrence from the U.S. Fish and Wildlife Service. No Likely to Adversely Affect determinations were made for federally-listed species and no species would be impacted to the degree that

population viability would be compromised. Some impacts would potentially occur to individuals of certain species and these impacts are discussed and documented in the DEIS.

Comment: "If it is determined that the finally selected project alternative could adversely affect any threatened or endangered species…the final EIS should include the Biological Assessment and associated U.S. Fish & Wildlife Service Biological Opinion or formal concurrence." (EPA, 14)

FS Response: No Likely to Adversely Affect determinations were made for any threatened or endangered species. A Not Likely to Adversely Affect determination was made for lynx and a Biological Assessment was prepared. The U.S. Fish and Wildlife Service has replied to the Lolo NF with a letter of concurrence.

Comment: "The Lolo NF has never determined minimum viable populations for any MIS or TES species as NFMA requires, nor has it specified the amount and distribution of habitat necessary to maintain viable populations. Nor has it monitored population trends of indicator species, as NFMA requires. The EIS must disclose the range of populations of MIS or TES species, and the historic range of important habitat components and spatial considerations." (WW, 21)

FS Response: Estimates of historic conditions and wildlife habitat currently available for several MIS and/or TES species at Lolo NF, HUC 4 or HUC 6, and/or Northern Region levels have been made recently (Hillis et. al., 2002a; Hillis, 2002b; Hillis et. al., 2002c; Hillis and Lockman, 2003; Hillis et. al., 2003a; Hillis et. al., 2003b; Hillis et. al., 2003c; and Hillis et. al., 2003d). Forest Inventory and Analysis (FIA) data was also recently completed to estimate the amount of old growth and snag density on the Lolo NF (Czaplewski, 2003); the results of which can be used to interpret availability and distribution of pileated woodpecker habitat across the Forest. Samson 2006a and Samson 2006b consider population viability and conservation strategies for black-backed and pileated woodpeckers, flammulated owls, and northern goshawks at both the Forest level and across the Northern Region. See DEIS pages 54-123 for specific species information and references.

The Lolo NF has conducted or participated in monitoring efforts for a variety of species. These efforts include:

- Participation in the Northern Continental Divide Ecosystem Grizzly Bear project which involved hair snagging to determine population status of grizzly bears within this ecosystem
- Participation in the National Lynx survey as well as the ongoing lynx research headed by the Rocky Mountain Research Station. These two studies have contributed dramatically to our understanding of lynx in the lower 48 and specifically to lynx populations in Montana with Seeley Lake Ranger District, Lolo NF being a focal area.
- Participation in a fisher survey headed by the Rocky Mountain Research Station to establish population estimates and baseline information for fisher across several national forests in Montana.
- Coordination of crews doing regional surveys for goshawks, black-backed woodpeckers, and flammulated owls. This is work funded by the Northern Region and coordinated through the Avian Science Center. Results of this work are being used to develop habitat models, refine population viability models, and further our overall understanding of these species and their distribution across the Region.

- Project-specific surveys have been conducted on the Lolo NF for species such as flammulated owls and goshawks. Pre-and post-treatment information is available for several projects, and we are in the process of updating our monitoring plan to incorporate new protocols and information. Surveys for flammulated owls and goshawks have been conducted for the Butte Lookout project (DEIS pages 60 – 61, 95, and 101 - 102) and this information is available in the Project File.

Comment: "The impacts of both winter and non-winter motorized route densities must be adequately considered… It is not clear that the Lolo NF has a complete understanding of the current level of use of the project area for snowmobiles and other motorized recreational users. Please analyze the cumulative impacts on lynx from the additional new roads, additional skid trails, and other logging access routes to be constructed in the project area—roads/access routes that could be used by snowmobiles and other motorized recreational users, snowshoers, and cross country skiers long after the logging activities have stopped." (WW, 29)

FS Response: The DEIS discusses roads and road access in several sections including the transportation (DEIS pages 241 – 268), fisheries/hydrology (DEIS pages 123 – 163) and wildlife (DEIS pages 63 – 119) sections. Further the lynx analyses in the (DEIS pages 62 – 71) and Biological Assessment specifically address motorized use and snowmobile use to the degree specified by the Northern Rockies Lynx Amendment (NLRA, USDA Forest Service 2007). Please be aware that the NLRA supersedes the Lynx Conservation Strategy and Assessment (LCAS) and that some issues related to lynx have been clarified by new research since the LCAS came out in 2000. One such issue is snowmobiling and snow compaction.

A Not Likely to Adversely Affect determination for lynx was made for this project. As such, a Biological Assessment was prepared and submitted to U.S. Fish and Wildlife Service. The Lolo NF received a letter of concurrence from U.S. Fish and Wildlife Service, and they proposed no additional requirements or analysis.

Comment: "From Ruggiero, et al. (1999) "Lynx metapopulation dynamics operate at regional scales" (p. 24). There must be maps and adequate discussion of the connectivity issue in the EIS, making it possible to see the landscape features that affect connectivity and metapopulation dynamics within and between LAUs both within and outside the project area, a goal of the LCAS mapping requirement." (WW, 30)

FS Response: Please see http://www.fs.fed.us/r1/planning/lynx/maps.htm for a map showing large-scale lynx habitat connectivity and linkage areas. Although this map was not referenced specifically in the DEIS it was considered, and the project does not fall within any identified linkage area. In addition, the Biological Assessment for lynx presented to the U.S. Fish and Wildlife Service for concurrence discusses habitat connectivity (BA pages 14-15).

Comment: "…please fully analyze an alternative that would not propose to log in any old growth or old-growth associated species' habitat. All areas proposed for burning or logging must be surveyed specifically to determine their old-growth characteristics. Please disclose the expected amount of error in such methodology and disclose the average and range of block sizes of the old growth sampled." (WW, 22)

FS Response: Neither of the two action alternatives analyzed in this project include proposals to log in old growth. All areas proposed for treatment have been evaluated as to their respective old growth conditions according to Green et. al. (2005).

With the exception of one prescribed burn unit (Unit 67), any proposed units meeting Green et. al. were dropped from the alternatives in earlier phases of the analysis.

Comment: Please disclose the best information on:

- how much old-growth forest existed before logging, what the normal historical ranges have been.
- how much has been logged or lost due to road building, land exchange, wildland fire, poorly implemented dry-site old growth "restoration treatments", or simple forest succession during original Forest Plan implementation.
- the impacts of this cumulative loss of old growth on wildlife species.
- how much effective old growth is expected to be lost in the future due to these effects. (WW, 23)

FS Response: This project does not propose to conduct mechanical treatment in any old growth. Prescribed burning is proposed on one 109-acre unit (Unit 67) of old growth and the effects of this activity have been analyzed in the DEIS pages 49 – 53.

Comment: "The Lolo NF has failed to cite any evidence that its managing for "large tree" (i.e., old growth) strategy will improve old growth or old-growth wildlife species habitat over the short-term or long-term…Please disclose the best information from Lolo NF monitoring that proves the areas to be "treated" will retain characteristics meeting Regional or Forest Plan old growth criteria, or how they will at some specified time in the future. Please disclose the best information from Lolo NF monitoring for the presence of old growth wildlife species in areas previously treated as now proposed." (WW, 24)

FS Response: The Lolo NF is currently compiling old growth data with preliminary findings and methodology, which is discussed in "Effects of Silvicultural Treatments on Old-growth Characteristics and Associated Wildlife Habitat" (Lolo NF, 2007). This study (2006-2010) examines the effects that various vegetation management treatments and wildfires have on stand structure and the Lolo NF's ability to meet the Northern Region old growth definitions adopted by the Forest in 1994. It also examines whether old growth associated species continue to use treated stands after treatment and after wildfire. Data collection for this monitoring effort is ongoing at this time.

Comment: The Lolo NF must disclose which, if any, MIS are to indicate old-growth that is characterized by relatively open canopy closure and not very dense with trees; and if none do, the FS must designate an appropriate scientifically justified MIS. (WW, 25)

FS Response: We do not have an MIS that specifically characterizes old growth with relatively open canopy closure and not very dense understory. In this project, we are not conducting any mechanical treatments within old growth. There is no reason to designate such a species nor is it required under NFMA.

Comment: "Is it the Lolo NF's position that maintaining a certain percentage of old growth on the Forest (such as the 10% prescribed by Lesica, 1995) is enough to maintain population viability of all species needing old-growth habitat? If so, what scientifically based rationale (i.e., research results) is the Lolo NF relying upon to assert that maintaining that % old-growth on the Forest is enough to maintain population viability of all species needing old-growth habitat, when no baseline levels (pre-logging) have ever been disclosed? (WW, 26)

FS Response: No old growth forests or individual old growth trees are proposed to be cut in this project. In addition the DEIS includes management requirements (DEIS pages 22 - 23) to protect large trees as follows:

> "Live or dead trees 19 inches diameter at breast height (dbh) and larger would not be designated for removal except where required for the safe and efficient conduct of logging (e.g., for skid trails, landings, or roads that cannot be located elsewhere).
>
> No live old-growth trees, as defined by R1 Old Growth Criteria (Green 1992, 2005), shall be harvested or cut unless required by OSHA safety standards in an unavoidable instance (such as those described above). All live old-growth trees would be retained for biodiversity, legacy, and habitat in these landscapes.
>
> Retention of snags and large diameter trees is addressed in the vegetation section as well as by Forest Plan Standards. When possible, snags that must be felled to meet safety requirements should be cut at 15 feet or higher. This goal can be achieved when a mechanical feller-buncher is used. Priority should be placed on snags greater than 20 inch dbh and when possible, landings should be located so that snags in this size class do not need to be felled for safety."

See the "Past Activities" discussion in the DEIS Appendix C for the amounts of past harvests. The amounts of past harvests by vegetative structure is not determined. See the vegetative section of DEIS Chapter 3 pages 42 - 44 for further discussion about Lolo NF and R1 Old Growth policy.

Samson 2006a and 2006b address viability and conservation for three mature forest/old growth associated species (goshawk, flammulated owl, and pileated woodpecker). Based on the findings of these publications, we feel that suitable habitat for these species currently exists at levels which will ensure viability both at the Forest and Northern Region scales. In addition, we have management direction based upon best available science to ensure that our projects use appropriate analyses to assess project-specific impacts to these species and to incorporate appropriate management requirements to reduce or eliminate these impacts. For detailed discussion see DEIS pages 54 – 123.

Comment: "The Lolo NF must incorporate terms and conditions from a programmatic B.O. into a Forest Plan amendment or revision before projects affecting lynx habitat, such as this one, can be authorized." (WW, 27)

FS Response: The Northern Rockies Lynx Amendment (NRLA) has been completed and, as such, the Lolo Forest Plan has been updated to incorporate lynx management direction. The U.S. Fish and Wildlife Service has consulted on the NRLA and the Lolo NF will follow these terms and conditions.

Comment: "The Lolo NF cannot meet lynx denning requirements unless it is meeting Forest Plan old-growth requirements. The Programmatic BA's analysis of the ability of the Forest Plans, as "amended" by the LCAS, to prevent a "taking" of the lynx is based upon the Forests' meeting such management standards. As the Lolo NF has not yet proved it is in compliance with old-growth species' viability standards or adequately dealing with forestwide old-growth declines, the project may not be in compliance with the LCAS." (WW, 28)

FS Response: The LCAS has been replaced by the Northern Rockies Lynx Amendment (NRLA) (NRLA, USDA Forest Service, 2007). The Biological Assessment and the DEIS both address the issue of denning habitat as per guidance in the NRLA. In brief, the NRLA addresses denning habitat under Guideline Veg11 and states, "Denning habitat should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either

down logs or root wads or large piles of wind thrown trees (jack strawed piles). If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris, piles or residual trees to provide denning habitat in the future." This guidance is based upon lynx research conducted by the Rocky Mountain Research Station on the Seeley Lake Ranger District of the Lolo NF and also on the Kootenai NF. This research has shown that denning habitat is generally not limiting on these landscapes (Squires et. al., 2007). Based upon our on-the-ground observations within the project area, recruitment of large woody debris from beetle-killed lodgepole and subsequent blowdown and the fact that we are not entering old growth stands under the proposed activities, we are meeting the intent of Guideline Veg11.

Following is a link to a summary of the NRLA which details how this document amends Forest Plans. The U.S. Fish and Wildlife Service Biological Opinion on the NRLA can also be found on this site http://www.fs.fed.us/r1/planning/lynx/reports/feisfinal/02_summary.pdf

Comment: "The FS has still not sufficiently dealt with the issue of fragmentation, road effects, and past logging on old-growth species' habitat. The EIS must disclose the degree to which edge effects on old growth species' habitat exist, and how much total edge effect would be increased, by the alternatives." (WW, 31)

FS Response: We have addressed old growth associated species and their habitats in this project in a variety of ways:

- Avoided conducting mechanical treatment in old growth stands.
- Surveyed for flammulated owls and goshawks and buffered the goshawk nesting stand we located with an approximate 100-acre no treatment buffer, which is roughly twice the size of the recommended buffer. No flammulated owls were detected during our surveys.
- Incorporated management requirements as shown above under which we have excluded the removal of trees greater than 19 inches dbh with limited exceptions for safety.
- Analyzed the environmental effects of the proposed activities on these species and their habitats as is documented in the DEIS.

(Please see previous old growth discussions.)

Comment: As supported by findings in Mills (1994), Ruggiero et. al. (1994), and Marcot and Murphy (1992) "population viability must be assessed at least at the Forest-wide scale. Also temporal considerations of the impacts on wildlife population viability from implementing something with such a long duration as a Forest Plan must be considered." (WW, 32)

FS Response: Wildlife population viability is discussed on DEIS page 58. Briefly, the Northern Region uses a principle-based approach to population viability analysis (PVA) that is widely agreed to and supported in peer-reviewed, scientific literature (summarized in Samson 2006a with internal citations omitted here). The viability of individual species which may incur effects is discussed in the DEIS on pages 58 – 119.

Comment: The effects of fragmentation on old-growth habitat, as discussed in USDA Forest Service 2000a, could be exacerbated by this proposed project. Landscape connectivity as discussed in Harris and Voller (1998) and Harris (1984) must be considered. The EIS must analyze and disclose the fragmentation effects on old-growth species' viability, caused by the current conditions and by the proposed project." (WW, 33)

FS Response: We are familiar with the references mentioned (please note that Harris and Voller 1998 are actually Harrison and Voller).

For a discussion about linkage and fragmentation please see DEIS pages 121-123. There are several components of this project which mitigate impacts to old growth species and their habitats. Effects are disclosed in Chapter 3 of the DEIS and it is recognized that individuals of some species may experience impacts.

We realize that connectivity and fragmentation are complex and important issues. Please note that within scientific documents such as those mentioned, it is recognized that fragmentation and connectivity need to be viewed within the context of species.

Each species has different requirements related to these habitat components. As a general rule, forest fragmentation from a timber management standpoint is often associated with road building or regeneration harvest.

The following quotes from Harris (1984) illustrate this point.

Harris discusses connectivity and effective interior habitat of old-growth patches:

> Three factors that determine the effective size of an old-growth habitat island are (1) actual size; (2) distance from a similar old-growth island; and (3) degree of habitat difference of the intervening matrix. …(I)n order to achieve the same effective island size a stand of old-growth habitat that is surrounded by clearcut and regeneration stands should be perhaps ten times as large as an old-growth

Harris discusses habitat effectiveness of fragmented old growth:

> (A) 200-acre (80 ha) circular old-growth stand would consist of nearly 75% buffer area and only 25% equilibrium area. …A circular stand would need to be about 7,000 acres (2,850 ha) in order to reduce the 600-foot buffer strip to 10% of the total area. It is important to note, however, that the surrounding buffer stand does not have to be old growth, but only tall enough and dense enough to prevent wind and light from entering below the canopy of the old-growth stand.

It is important to note that Harris does not believe surrounding buffer stands need to be old growth. Given our improvement harvest prescriptions and our avoidance of treating old growth, we feel we adequately address concerns such as those raised here. We are not creating a sharp edge against old growth but rather conducting treatments that should promote longevity of stands and result in more old growth recruitment stands within the project area.

Comment: "Logging, roadbuilding and other disturbance associated with the project and other cumulative impacts could affect goshawk nesting, post-fledging family habitat, alternative nesting, foraging, competitors, prey and potential habitat, including areas far from cutting units…The scientific information on goshawks found in Center for Biological Diversity, 2004, should be considered in the EIS…Since the management direction proposed for the goshawk in the project area differs significantly from the current best science, the agency has a responsibility to clearly explain to the public why their own management direction would work." (WW, 34)

FS Response: The management direction proposed for goshawk in this project is based on current, best available science which has been incorporated into Northern Goshawk Northern Region Overview (2007). The goshawk nest protection we propose actually goes beyond what is recommended in the context of nest area buffers (DEIS pages 105 - 106). The WildWest Institute literature cited on the goshawk, the Center for Biological Diversity (2004), is somewhat

dated and focuses on literature and studies from Arizona. Please refer to Squires and Kennedy (2006), Samson 2006a and b and the Northern Goshawk Northern Region Overview (2007) for a more recent and regionally segregated review of pertinent goshawk research and management recommendations.

Comment: "The issue of fragmentation should have been more thoroughly considered with respect to goshawks…Crocker-Bedford (1990) recommends that a foraging area of >5000 acres of dense forest, in which no logging is permitted, be designated for goshawks, with additional areas of 2500-5000 acres of more marginal habitat designated beyond this 5,000 acre foraging area." (WW, 35)

FS Response: In "The Northern Goshawk Status Review," the U.S. Fish and Wildlife Service (Service) found that the goshawk typically uses mature forests or larger trees for nesting habitat (the nest area), however, it is considered a forest habitat generalist at larger spatial scales (USDI-FWS, 1998). The Service found no evidence in its finding that the goshawk is dependent on large, unbroken tracts of "old growth" or mature forest (63 FR 35183 June 29, 1998).

"Due to frequent bias in goshawk nest detection methods…goshawk selection of mature forests [for nesting] over other forest stages has been demonstrated in only a few studies" (Squires and Ruggiero, 1996 and Clough, 2000, both *in* Squires and Kennedy, 2006, page 25). Nonetheless, the pattern of goshawk nest site selection in coniferous forests, especially mature forests with closed canopy and open understory conditions, has emerged over and over in numerous studies throughout western North America (*in Ibid.*). Less commonly, goshawks have also been found nesting in more open forests (USDI FWS, 1998) as well as in small aspen stands surrounded by shrub-steppe (Younk and Bechard, 1994), riparian cottonwood (White et. al., 1965), and tall willow stands in the Arctic tundra (Swem and Adams, 1992) (all *in* Squires and Kennedy 2006, page 26).

In the DEIS page 101, "Goshawk hunt a variety of prey on the ground, on vegetation, and in the air, including: tree squirrels (all forest types and canopy covers); ground squirrels (open grass/shrub, clearcut areas); rabbits and hares (seedling/saplings, meadow/forest and riparian/forest ecotones, and old-growth); songbirds; woodpeckers; and grouse species that rely on a variety of forested and non-forested habitats (Squires and Reynolds, 1997; Squires and Kennedy, 2006). Goshawks have also been reported feeding on carrion, including gut piles left by hunters (Squires, 1995). In west central Montana, snowshoe hares and red squirrels are used extensively (Clough, 2000), and in Idaho, ground squirrels appear important (Patla, 1997)."

An analysis of available goshawk habitat by size class within the Butte Lookout Project Area is shown in Table 33 (DEIS page 104).

The Crocker-Bedford citation that Cameron Naficy of the WildWest Institute cites is from 1990 and is based on studies conducted on the Kaibab Plateau in Northern Arizona, which is an area with significantly different habitat conditions than those found on the Lolo NF.

Comment: "The EIS must consider the uncertain and precarious population status of the fisher…the proposed project could adversely impact fisher habitat as well as movement, denning, resting areas, genetic diversity, and other aspects of fisher life cycles." (WW, 36)

FS Response: Please see DEIS pages 76 – 80. On DEIS page 80, this project is "on a relatively small scale in relation to fisher home range size, old-growth stands are not proposed for treatment nor are riparian areas, and access would not be increased under either action alternative. Based on this rationale, the determination is that the two action alternatives May Impact Individuals of this species but would not have significant impacts at the population scale. The impacts would be primarily in the form of short-term displacement during the course of

timber removal activity and some loss of potential foraging habitat. These impacts would not likely result in any individual mortality. As such, the project would not increase the potential for further population declines or lead toward federal listing."

Comment: "…the FS has yet to design a consistent, workable, scientifically defensible strategy to ensure viable populations of the black-backed woodpeckers. Fire suppression, insect and disease suppression, and "salvage" logging policies of the Lolo NF are the biggest threat to black-backed woodpecker population viability on the Forest, unfortunately in failing to create a conservation strategy the cumulative impacts of the Lolo NF's ongoing fire suppression policy will remain unexamined. Please note that the three-toed woodpecker is another species that has similar habitat needs to the black-backed woodpecker." (WW, 37)

FS Response: Please see DEIS pages 87 – 92 for a discussion on black-backed woodpecker existing habitat and effects by alternative for the Butte Lookout project. Also note the references to Samson 2006a and Samson 2006b which address viability and conservation strategies for this and other sensitive species.

There are two significant considerations in respect to black-backed woodpecker habitat and conservation that apply to this project.

First, regional surveys conducted by the Avian Science Center in 2005 targeted beetle-infested stands to address the issue of whether these stands provide high quality black-backed habitat. Results of this research are available at http://avianscience.dbs.umt.edu/research_landbird.htm and show that the stands surveyed were not being utilized by black-backs to a significant degree. Other surveys within the Northern Region in recently burned stands provide different results and show that these stands are highly selected by black-backed woodpeckers for up to six years following fire (http://avianscience.dbs.umt.edu/research_landbird.htm).

The Lolo NF presently has about 200,000 acres of post-fire habitat that burned within the past 5 years (see table below). This post-fire habitat alone is more than six times the amount of habitat that Samson (2006b) estimated was needed to maintain black-backed woodpecker viability across Region 1.

Acres Burned in Wildfires on the Lolo National Forest

Year	***Acres Burned***
2007	138,376
2006	282
2005	6,104
2004	0
2003	60,105
Total	194,493

Therefore, it is erroneous to assume that Forest Service fire suppression or salvage logging has resulted in declining black-backed populations. Also note that the Lolo NF and other Forests across the Region are actively implementing and expanding their Fire Use programs which will ultimately result in more acres burned annually across the landscape. Many of these areas are roadless or otherwise designated as unsuitable for timber production, and salvage logging will not be pursued.

Comment: "The Lolo NF provides inadequate management strategies to insure viability of the pine marten. Ruggerio, et al. (1998) and Bull and Blumton, 1999, indicate that vertical and horizontal diversity provided by snags and large down woody debris are important habitat characteristics for the pine marten, another old-growth wildlife species. The treatments proposed for this project would reduce the availability of prey species for the marten." (WW, 38)

FS Response: Pine marten is not an MIS or sensitive species on the Lolo NF. This is not to say we are unconcerned with pine marten and marten habitat. However, we address habitat needs for this and other species indirectly through our coarse woody debris and snag requirements, our avoidance of old growth and our silvicultural prescriptions which retain large trees, defective trees and maintain general forested conditions.

Comment: "The high density of snags and defective trees within old growth (Green et. al., 1992) would likely be substantially eliminated with the planned logging. Please disclose how many old logging units in the project area are deficient in snags, another vital and necessary component of old-growth habitat." (WW, 39)

FS Response: The statement that "snags and defective trees within old growth would be substantially eliminated with the planned logging" is not accurate. First, there is no planned logging in old growth under any of the alternatives. Further, we have incorporated design criteria and management requirements (in compliance with the Forest Plan Standards) to retain snags, particularly high quality, large diameter snags such as western larch and ponderosa pine greater than 19 inches DBH.

Comment: "The EIS must consider that snags may be cut down for safety reasons during logging operations (due to OSHA regulations). The EIS must disclose <u>the amount of</u> snag loss expected because of safety concerns and also skyline corridors and other methods of log removal—the loss could be more significant that disclosed." (WW, 40)

FS Response: We are uncertain of how many snags may be lost but do include several management requirements to ensure retention of most large diameter, high quality snags and live trees. We further add mitigation to leave some portion (15 feet) of snags felled for safety standing. Please see previous responses on snags and old growth.

Comment: The effects of the proposed project on pileated woodpeckers must be considered. (WW, 41)

FS Response: The DEIS addresses existing habitat conditions and effects of alternatives on pileated woodpeckers (DEIS pages 114 - 118). The DEIS also incorporates management requirements to protect old growth and old growth features such as large diameter trees and snags, which are described on DEIS pages 22 - 23.

Comment: "The EIS must also disclose the cumulative impacts of ever-increasing motorized recreational use on wildlife species – both legal and illegal." (WW, 42)

FS Response: Both legal and illegal motorized use within the project area are limited according to Missoula Ranger District personnel, and this use is mitigated/minimized within the project area by road closures (either seasonally or year-round (DEIS pages 244 –245).

The project proposes to decrease overall road densities and does not propose any increases in open roads or over-the-snow routes. For these reasons, motorized recreational use was not considered to be of significant importance in the cumulative effects analysis for this project.

Comment: The FS has "not taken steps necessary to insure viability…like follow its own directives and design conservation strategies for sensitive species…The FS must tier the

viability analyses for Sensitive species that would be impacted by the proposed project to a landscape analysis of species viability that would allow for some assurances to the public that species viability is currently being insured in spite of continued habitat destruction and/or alteration." (WW, 43)

FS Response: Samson 2006a and Samson 2006b consider population viability and conservation strategies for black-backed and pileated woodpeckers, flammulated owls, and northern goshawks at both the Forest level and across the Northern Region. Also please see DEIS (pages 54-123).

Comment: "The FS has admitted that the use of database habitat information, as the Lolo NF relies upon for project analyses, is suspect: "Habitat modeling based on the timber stand database has its limitations: the data are, on average, 15 years old; canopy closure estimates are inaccurate; and data do not exist for the abundance or distribution of snags or down woody material…" (U.S. Forest Service, 2000c). How similar in quality is the Lolo NF's database information? What wildlife analysis or modeling to be used relies on the database? On average, how old is the Lolo NF's database information? Please disclose if the Lolo NF's database information is such that it is similarly unreliable for wildlife analyses as is the IPNF's." (WW, 44)

FS Response: We are not familiar with the document referred to but do not believe it was specific to the Lolo NF. While we do rely on some database habitat information for project analysis, this is not the only source of habitat information we used for this project or for any recent projects. We incorporate past stand exam information and stand management information with more recent vegetative plots (some of which are done specific to the project and fill gaps or shortcomings of previous stand exams).

In cases where we are looking at watershed level habitat, we use the most current data (in this case VMAP and FIA) to incorporate pertinent vegetative/habitat conditions across all ownerships. Much of our vegetation data is from the early-to mid-1990s, and we consider this data to be reliable for many of the wildlife habitat associations and analyses we conduct. Given a 10 to 15 year data gap, findings such as habitat type, forest type, age class and size class are confirmed by field reconnaissance to insure our activity and fire layers are accurate.

Comment: "The EIS must disclose a baseline or quantitative population data for Sensitive species and their habitats. The FS must obtain or maintain any past or current hard population or inventory or monitoring data for the Sensitive species at issue in the project area or for the Lolo NF as a whole." (WW, 45)

FS Response: Estimates of historic conditions and wildlife habitat currently available for several MIS and/or TES species at Lolo NF, HUC4 or HUC 6, and/or Northern Region levels have been made recently (Hillis et. al., 2002a; Hillis, 2002b; Hillis et. al., 2002c; Hillis and Lockman, 2003; Hillis et. al., 2003a; Hillis et. al., 2003b; Hillis et. al., 2003c; and Hillis et. al., 2003d). An analysis of Forest Inventory and Analysis (FIA) data was also recently completed to estimate the amount of old growth and snag density on the Lolo NF (Czaplewski, 2003); the results of which can be used to interpret availability and distribution of pileated woodpecker habitat across the Forest. Samson 2006a and Samson 2006b consider population viability and conservation strategies for black-backed and pileated woodpeckers, flammulated owls, and northern goshawks at both the forest level and across the Northern Region. See also DEIS (pages 54-123) for specific species information and references.

The Lolo NF has conducted or participated in monitoring efforts for a variety of species. These efforts include:

- Participation in the Northern Continental Divide Ecosystem Grizzly Bear project which involved hair snagging to determine population status of grizzly bears within this ecosystem
- Participation in the National Lynx survey as well as the ongoing lynx research headed by the Rocky Mountain Research Station. These two studies have contributed dramatically to our understanding of lynx in the lower 48 and specifically to lynx populations in Montana with Seeley Lake Ranger District, Lolo NF being a focal area.
- Participation in a fisher survey headed by the Rocky Mountain Research Station to establish population estimates and baseline information for fisher across several national forests in Montana.
- Coordination of crews doing regional surveys for goshawks, black-backed woodpeckers, and flammulated owls. This is work funded by the Northern Region and coordinated through the Avian Science Center. Results of this work are being used to develop habitat models, refine population viability models, and further our overall understanding of these species and their distribution across the Region.
- Project-specific surveys have been conducted on the Lolo NF for species such as flammulated owls and goshawks. Pre-and post-treatment information is available for several projects, and we are in the process of updating our monitoring plan to incorporate new protocols and information. Surveys for flammulated owls and goshawks have been conducted for the Butte Lookout project (DEIS pages 60 – 61, 95, and 101 - 102) and this information is available in the Project File.

Grazing

Comment: "The EIS must present information on the impacts of livestock grazing on the national forest land and on lands of other ownership in the project area." (WW, 54)

FS Response: The scope of this analysis in relation to livestock grazing is limited to the affected environment and environmental effects of the alternatives. These are described on DEIS pages 229-233. While the Butte Lookout analysis area includes over half (10,386 acres of 19,664 acres) of the South Fork East Fork Lolo Creek Cattle Grazing Allotment, the allotment was terminated in 2008 between issuing the Butte Lookout DEIS and this FEIS.

Livestock grazing is also discussed in the Hydrology/Fisheries section of the DEIS at pages 139, 158, and 161, which disclosed that grazing was not negatively affecting water or stream resources.

Noxious Weeds

Comment: "…an effective noxious weed control program should consider restrictions on motorized uses, particularly off-road uses, where necessary…restrictions on motorized uses may be needed after burning and harvest activities until native vegetation is reestablished…" (EPA, 15)

FS Response: We agree with your comment. Cross-country motorized use is already prohibited on the Lolo NF. Motorized use is restricted to roads and trails designated as open on the 3/15/01 Lolo NF Travel Plan.

Comment: "The effects of burning on the potential stimulation of noxious weeds should be evaluated during site-specific level analysis. If sufficient vegetation is killed it may warrant revegetation efforts." (EPA, 16)

FS Response: This issue is addressed in the 12/11/07 Lolo NF Integrated Weed Management ROD and FEIS (which is incorporated into this analysis by reference) on pages 52-53 and 86. Prescribed fire and its effect on weeds is a frequently discussed topic on the Lolo NF between weed managers and fire managers. Unfortunately there is little data on the effects of prescribed fire on weeds.

In response to this data gap, the Lolo NF identified and reported this research need to Peter Rice at University of Montana and Mick Harrington at the FS Rocky Mountain Research Station. Rice and Harrington responded to the request with a study and Final Report (12/31/05) entitled Stabilization of Plant Communities After Integrated Picloram and Fire Treatments and is cited and summarized on DEIS page 78. In this study we hoped to learn if (and if so in what sequence) herbicides and prescribed fire could be utilized on weed infested sites to move the plant community closer to the potential natural plant community definitions.

Rice and Harrington summarized the burning results of their study as follows:

> *"Burning alone did not affect target weed abundance during the period of response measurement. Nor did burning in combination with spraying alter the high level of weed control obtained by spraying alone. Burning did not effect overall species composition nor similarity to the potential natural communities at three of the study sites. The burning did alter community level response at one site which was dominated by mature rough fescue bunches and the burned plots at this site showed retrogression relative to the habitat type definition. At two sites the canopy cover of rough fescue or combined native bunchgrasses were reduced in the growing season following the spring burn. However these burn influences were all limited to the growing season immediately after the burn."*

We think it is important to consider these results in the context of low intensity spring burns in open overstory conifer canopies. Based on our experience, we feel that the effects of prescribed fire on weeds may vary based on fire intensity, natural habitat type and the species and character (e.g., rhizomatous vs. tap-rooted) of weed. While further research needs to be done to measure the effects of different fire intensities on different weed species, the burning proposed in this analysis would be low to moderate intensity.

Comment: Management techniques to control weeds should be prioritized and focus on using non-chemical treatments first. It is not clear if herbicides other than Milestone are proposed; it is important that impacts of all potential herbicides to be used are evaluated. (EPA, 17)

FS Response: The 12/11/07 Lolo NF Integrated Weed Management (LNFIWM) Record of Decision and FEIS are incorporated into this analysis by reference. The herbicides that could be used in this project are discussed in that analysis and ROD and are shown in below:

Herbicide	Selective?	Common Product Names
Aminopyralid	Yes	Milestone and ForeFront R & P
2,4-D	Yes	Formula 40, Hi-Dep, Weedar 64
Chlorsulfuron	Yes	Telar
Clopyralid	Yes	Transline
Dicamba	Yes	Banvel, Veteran 10-G
Glyphosate	No	Roundup, Rodeo, Accord
Imazapic	Yes	Plateau

Herbicide	Selective?	Common Product Names
Imazapyr*	Yes	Arsenal, Chopper, Contain
Metsulfuron methyl	Yes	Escort, Ally
Picloram	Yes	Tordon
Triclopyr*	Yes	Garlon

The target weed species for each of these herbicides is displayed in Appendix I of the 12/11/07 LNFIWM FEIS. Each weed infestation encountered in this project would be evaluated to determine the most effective and least impactive (to non target plants and resources) weed control technique from a weed management toolbox that includes education and awareness, prevention, ground and aerially applied herbicides, goat and sheep grazing, biological control agents, mowing, pulling, seeding and fertilizing.

The treatment priorities on the Lolo NF and in this project are:

- Bunchgrass big-game winter ranges
- Weed-free areas, and the roads, trails and trailheads that lead into them
- Areas of concentrated public use (since people spread weeds)
- Administrative sites
- National Forest lands bordering private lands with active weed-controlling programs
- Disturbed areas

Comment: Streams and wetlands in areas to be sprayed with herbicides should be flagged on the ground to assure that herbicide applicators can avoid them. (EPA, 18)

FS Response: Streams and wetlands need to be considered and protected during herbicide operations. As noted above, the 12/11/07 Lolo NF Integrated Weed Management ROD and FEIS is incorporated into this analysis by reference. Mitigation Measures 21-28, 38 and 39 on pgs 30-31 of the LNFIWM FEIS provide for protection of streamside wet land area to be sprayed with herbicides. Additionally a Management Requirement in the Butte Lookout DEIS (page 25) requires that, "during project layout personnel would identify wet areas and/or stream channels, and notify appropriate water and/or fisheries specialist and botanist regarding any special management requirements that may be required (e.g., an appropriate no-activity buffer around these wet areas.)"

Comment: "Picloram is a particularly persistent, mobile, and toxic herbicide. Road ditches leading to intermittent and perennial streams should be flagged as no-spray zones and not sprayed with picloram-based herbicides." (EPA, 19)

FS Response: The mitigation measures referenced above are designed to prevent picloram from reaching streams.

Comment: "The EIS must disclose how the productivity of the land been affected in the project area and forestwide due to noxious weed infestations, and how that situation is expected to change." (WW, 62)

FS Response: The 12/11/07 Lolo NF Integrated Weed Management ROD and FEIS are incorporated into this analysis by reference. The effects of weeds on the resources found on the LNF is discussed in detail in Chapters 1 and 3 of 12/11/07 LNFIWM FEIS. Briefly, the

LNFIWM FEIS discusses that noxious weed populations on the Lolo NF are widespread and continue to expand. Forest resources are negatively impacted by these existing and expanding populations. Noxious weeds diminish the productivity, biodiversity, and appearance of Lolo NF lands, as well as causing habitat loss and adversely affect diversity and habitat function in plant communities.

Comment: "Please disclose the results of weed treatments on the Lolo NF that have been projected to significantly reduce noxious weed populations over time, or prevent spread. This is an ongoing issue of land productivity." (WW, 63)

FS Response: The 12/11/07 Lolo NF Integrated Weed Management ROD and FEIS are incorporated into this analysis by reference. The results of the weed treatments used on the LNF are discussed on FEIS pgs 48-59. The discussions included on these pages pertain to ground monitoring done on numerous sites across the Forest that were treated with herbicides, biological agents, and/or manual treatments (e.g., hand pulling). These treatments targeted various weed species.

Comment: "The EIS must include the results of monitoring of noxious weed infestation from past management actions in the Lolo NF, and give an indication of the effectiveness of any proposed noxious weed treatments to be carried out in the foreseeable future in the project area. The EIS must also disclose the risks of the herbicides that would be used." (WW, 73)

FS Response: Please see the response to the comment above. Chapter 3 of the 12/11/07 Lolo NF Integrated Weed Management ROD and FEIS, which are incorporated into this analysis by reference, include thorough discussions of the monitoring results, effectiveness of past management actions, and risks of herbicides that would be used.

Economics

Comment: "Both Alternatives 4 and 5 contain too much helicopter harvesting to be economical in the current lumber market…either drop the heli units…make the heli units optional…delay the project until market conditions support expensive logging methods….build/improve additional access to convert heli units to tractor or cable." (SML, 1)

FS Response: Current market conditions do not support the implementation of helicopter logging at this time. During contract preparation, the decision to include or drop these units from implementation will be made after a comprehensive appraisal is completed. It is very likely these units will become optional, will not be included in the contract, or will be included in another contract later that is helicopter yarding only. We would like to keep these units under NEPA analysis in the event of a change in lumber markets that would make implementation of these units feasible as part of this sale, or at a later date under another contract. Building or improving additional access routes to access helicopter units was not considered in detail because the cost of required improvements was prohibitive as were the associated resource impacts.

Comment: "The economics analysis must include an itemized disclosure of costs vs. benefits, and a Present Net Value (PNV) discussion." (WW, 75)

FS Response: "Present Net Value (PNV) is used as the indicator for financial efficiency (DEIS page 250). PNV combines benefits and costs that occur at different times and discounts them into an amount that is equivalent to all economic activity in a single year. For the analysis in the DEIS, PNV was discounted to 2006 dollars because inflation rates were not available for 2008 or the last quarter of 2007." Because market conditions declined between when the DEIS was published in March 2008 and the issuance of the FEIS, the economic analysis was updated in

2009. The new updated analysis used 2008 dollars because inflation rates were not available for 2009.

This project would be implemented in various stages over several years. For example, some road decommissioning could occur at a different time than timber harvesting, and prescribed fire and weed spraying would occur at different time intervals which may or may not be at the same time as other planned activities. Because of this dynamic implementation structure, PNV is used to compare dollar values as if projects all occurred in the same year. This information is used for comparison between alternatives only, and is not intended to be a complete representation of actual costs or benefits incurred.

An itemized list of included costs and benefits is attached at the end of this document (see Attachment 1). Reference to year "0" is to make the model run analysis with all activities occurring in the same year. Some quantities were lumped together for analysis where costs were provided as a total cost and not per unit cost. Stumpage value (benefits) was determined using a variation of the Northern Region Transaction Evidence equation, which is not immediately responsive to changing market conditions that have been recently experienced, and may not accurately reflect additional operational costs such as increasing diesel prices. For this analysis, non-market benefits such as improved water quality or wildlife habitat were not considered because of the difficulty in assigning a monetary value to these benefits.

Visual Quality

Comment: The Preferred Alternative is designed such that it would not "adversely affect the viewshed as experienced from the highway….or from the Lewis and Clark campsite." (USDI, 1)

FS Response: Both Alternatives 4 and 5 were designed and incorporate mitigation to reduce the effects of the proposed activities on visual quality. This project was designed to meet the Visual Quality standards prescribed in the Forest Plan (DEIS pages 210 – 213).

Cultural Resources

Comment: "The road construction work entailed in both Alternatives 4 and 5 could potentially have unforeseen adverse impacts upon previously unidentified archeological sites…it is recommended that Phase I archeological investigations of 25-foot buffer areas along proposed road corridors be conducted prior to road construction." (USDI, 3)

FS Response: The project area has been surveyed for heritage resources, and no alternative would adversely affect any known cultural resource site (DEIS page 15). Should any new sites be discovered during project implementation, activities would be modified, moved or deleted with Forest archaeologist consultation to protect the resource (in addition to consultation with MTSHPO and the Confederated Salish Kootenai Tribe).

Miscellaneous Comments/concerns

Comment: "Please include a map in the EIS that clarifies roadless boundary issues. It is not adequate to merely accept previous, often arbitrary roadless inventories—unroaded areas adjacent to inventoried areas were often left out." (WW, 20)

FS Response: Map B-19 displaying the Butte Lookout Analysis Area and Inventoried Roadless Areas in the general vicinity is included in FEIS Appendix B.

Comment: "The EIS must contain a monitoring plan that includes important affected resources such as wildlife, soils, fuels, and fire risk." (WW, 51)

FS Response: Appendix D, “Monitoring and Evaluation Plan” discusses monitoring elements for all of the resources discussed in the DEIS.

Comment: “We request the FS adopt the Forest Restoration Assessment Principles found within the Forest Restoration Principles and Criteria (DellaSala, et al., 2003) as a screen for all proposed actions.” (WW, 50)

FS Response: The range of treatments analyzed in this assessment includes numerous activities that respond to the Forest Restoration Principles and Criteria. Forest-wide adoption of these principles is beyond the scope of this analysis.

Comments on the NEPA Process

Comment: “Additional analysis and information is needed to fully assess and mitigate all potential impacts of the management actions.” (EPA, 4)

FS Response: Please refer to the above responses to your comments as well as those made by others and the modifications to the DEIS that appear in the FEIS.

Comment: “The Roads Analysis Process (RAP) for this area must be subject to the full public review process, in terms of providing alternative ways of managing the road system.” (WW, 13)

FS Response: The Roads Analysis Process (RAP) is designed to provide information concerning road system opportunities, needs, and priorities that can be incorporated into the NEPA process where the actual road management decisions are made. The basic RAP information and any alternative road management generated during the NEPA process are available for public scrutiny and comment. Public involvement during the NEPA process may generate change in proposed management or create additional road management alternatives.

Comment: “The EIS must contain a discussion of the connection between the major individual management actions carried out in the past, and the environmental harms or benefits of each of those actions.” (WW, 46)

FS Response: Please refer to the cumulative effects discussions for each resource in DEIS Chapter 3 as well as Appendix C, which provides a thorough discussion of Past, Present, and Reasonably Foreseeable Future Actions.

Attachment 1: Quick-Silver Investment Analysis **Transaction Details - Sorted by Partner**

Forest: Lolo, Missoula **USDA Forest Service**
Analyst: Ivy Kostick **NRIS-Human Dimensions Module**
File: BUTTE LOOKOUT EIS.QSP **East Lansing, MI**
Project: Butte Lookout EIS
Cost USFS

Alternative 4	Category	Year(s)	Quantity	Value	Rate(%)	Base	Update
EMB	Fuels	One time	109.00 acre	$100.00	0.00	2008	1/14/200
Notes: EMB financed with appropriated or other funds.							
Underburning	Fuels	One time	369.00 acre	$225.00	0.00	2008	1/14/200
Notes: Assume half acres treated with BD deposits as part of timber sale, half appropriated funds.							
Additional weeds	Resources	One time	1.00 total	$35,866.00	0.00	2008	1/10/200
Notes: Non timber weed spraying. Includes additional decomissioning and spraying in harvest and EMB units.							
Timber Weeds	Resources	One time	1.00 total	$19,050.00	0.00	2008	1/10/200
Notes: Timber related weed spraying. Includes haul routes (pre and post haul), decomissioned roads and new construction.							
Non sale roads	Roads	One time	1.00 total	$362,000.00	0.00	2008	1/10/200
Notes: Additional road work not included in timber sale.							
Timber Reconstruction	Roads	One time	1.00 total	$611,000.00	0.00	2008	2/14/200
Notes: Includes BMP reconstruction, long and short term construction, 5 miles road closure, one culvert replacement. Changed from $608,000 to $611,000 on 2/14/2008 due to updated engineering costs.							
Dust abatement	Watershed	One time	1.00 total	$8,700.00	0.00	2008	1/10/200
Notes: Six miles dust abatement on Elk Meadows road.							

Alternative 5	Category	Year(s)	Quantity	Value	Rate(%)	Base	Update
EMB	Fuels	One time	293.00 acre	$100.00	0.00	2008	1/14/200
Notes: Financed with appropriated or other funds.							
Underburning	Fuels	One time	264.00 acre	$225.00	0.00	2008	1/14/200
Notes: One half acres treated with BD deposits, remaining half with appropriated funds.							
Additional weeds	Resources	One time	1.00 total	$35,550.00	0.00	2008	1/14/200
Notes: Includes spraying for additioanl decomissioning and in harvest and EMB units.							
Timber weeds	Resources	One time	1.00 total	$13,530.00	0.00	2008	1/14/200
Notes: Includes pre and post haul, new construction and decomissioning spraying.							
Non-sale roads	Roads	One time	1.00 total	$362,000.00	0.00	2008	1/14/200
Notes: Additional decomissioning and culvert replacement, not part of timber sale.							
Timber reconstruction	Roads	One time	1.00 total	$508,000.00	0.00	2008	1/14/200
Notes: Timber sale reconstruction. Includes BMP reconstruction, short and long term construction, 5 miles closure and one culvert replacement.							
Dust abatement	Watershed	One time	1.00 total	$8,700.00	0.00	2008	1/14/200
Notes: Six miles of chloride magnesium dust abatement on Elk Meadows road.							

BENEFIT USFS

Alternative 4	Category	years	Quantity	Value	Rate(%)	Base	Update
Stumpage	Timber	One time	14,883.00 CCF	$67.42	0.00	2008	1/10/200
Notes: Stumpage value from R1 spreadsheet. Includes logging cost by yarding system, and haul.							
Alternative 5	Category	Year(s)	Quantity	Value	Rate(%)	Base	**Update**
Stumpage	Timber	One time	14,014.00 CCF	$57.59	0.00	2008	1/14/200
Notes: Stumpage calculated from R1 spreadsheet. Includes logging cost by system and hauling							