

CITIZENS FOR BETTER FORESTRY

P.O. Box 818
Arcata, CA 95518
(707) 822-1343
<http://www.cbfinfo.com/cbf>

May 1, 2001

S.E. "Lou" Woltering
Forest Supervisor
Six Rivers National Forest
1330 Bayshore Way
Eureka, CA 95501

Re: "Phase I - Fuels Treatment For Community Protection" DEIS Supplemental Comments

Dear Lou,

Please accept the following supplemental comments on the Draft Environmental Impact Statement (DEIS) for the "Phase I - Fuels Treatment for Community Protection" timber sale, submitted on behalf of Citizens for Better Forestry, California Wilderness Coalition, Northcoast Environmental Center, Klamath Forest Alliance, Center for Biological Diversity, Western Fire Ecology Center, American Lands, Environmental Protection Information Center, Redwood Chapter Sierra Club, Klamath-Siskiyou Wildlands Center, and South Fork Mountain Defense.

These supplemental comments are submitted to clarify and expand upon the issues and concerns we shared with you in our scoping comments and initial DEIS comments. We trust that these issues and concerns will be fully addressed in the Final EIS to be prepared for the proposed actions.

I. GENERAL COMMENTS

1. We oppose the action alternatives outlined in the DEIS.

We have numerous concerns related to the proposed actions described in the Draft Environmental Impact Statement (DEIS). The DEIS has not alleviated the issues and concerns we shared with you in our scoping comments on the proposed project. We still conclude that the proposed actions will not achieve community protection or watershed restoration objectives, but will instead result in significant adverse environmental impacts and increased fire risk. We therefore oppose the proposed timber sale, and urge you to develop alternatives that provide for real community protection and watershed restoration in the area, including non-commercial small-diameter fuels reduction close to communities, erosion control activities, road decommissioning, and prescribed burning. We oppose the action alternatives outlined in the DEIS. Until such time as a non-commercial alternative is developed, we support the No Action Alternative.

2. There is no ecological need for the project.

The DEIS fails to provide sufficient evidence to support the claim that salvage logging is ecologically necessary in the burned area. The only demonstrated value of post-fire logging is economic and the desire to log in burned stands is strictly a matter of trying to extract the maximum amount of timber value. On the other hand, there is ample evidence to demonstrate that salvage logging and road construction will significantly damage soil, water, and wildlife habitat (McIver and Starr 2000). In fact, the proposed salvage logging and road construction are more likely to create more problems in the ecosystem rather than alleviate them. As Beschta et al. (1995) explain: "Human intervention on the post-fire landscape may substantially or completely delay recovery, remove the elements of recovery, or accentuate the damage. Many such adverse consequences are difficult or impossible to predict or foresee in specific situations. In this light there is little reason to believe that post-fire salvage logging has any positive ecological benefits, particularly for aquatic ecosystems. There is considerable evidence that persistent, significant adverse environmental impacts are likely to result from salvage logging, based on many past cases of salvage projects, plus our growing knowledge of ecosystem functions and land-aquatic linkages. These impacts include soil compaction and erosion, loss of habitat for cavity nesting species, loss of structurally and functionally important large woody debris."

The DEIS goes to great lengths to convince the reader of the risks that wildfires pose to the environment, particularly for aquatic systems. In fact, the risks from wildfire to aquatic systems are greatly exaggerated, while the potential impacts from salvage logging and road construction are underestimated. Most of these claims are speculative and conjectural. Experience demonstrates that natural disturbance events are not as likely to significantly impact the environment as human disturbance. For example, in a comprehensive review of fire and aquatic ecosystems in North America, Gresswell (1999) concludes that "even in the case of extensive high-severity fires, local extirpation of fishes is patchy, and recolonization is rapid. Lasting detrimental effects on fish populations have been limited to areas where native populations have declined and become increasingly isolated because of anthropogenic activities." We conclude that the greatest risk to the ecosystem of the area is continued logging, road construction, and fuel break construction as proposed in the DEIS, not another wildfire. The DEIS does little to convince us otherwise.

3. The DEIS does not provide sufficient information on actual timber volume to be removed under the action alternatives.

According to Table 2-5, 21.4 million board feet (MMBF) of merchantable volume will be removed under the proposed action, 19.6 MMBF under Action Alternative 1, and 20.7 MMBF under Action Alternative 2 (DEIS at II-27). However, the DEIS estimates that the total gross volume within proposed merchantable treatment units is 55.9 MMBF (DEIS at III-29). The timber volumes cited in Table 2-5 appear to be estimates of net volume to be sold under each alternative after adjusting for deterioration, but it is unclear actually how much material would be logged and actually removed from the project area under each alternative. Is it the 55.9 MMBF gross volume referenced at III-29? What will happen to

the ~35 MMBF of timber that is left over? Will it remain on site as cull logs and slash, or will it be removed from the site and taken to the mills? The FEIS needs to clarify this situation. In addition, the reference cited in Table 3-21 (Kimmey, 1955) is not listed in the Literature Cited section of the DEIS. Please provide this in the FEIS.

4. The DEIS fails to demonstrate that there is an "emergency" situation which necessitates an exemption from stay by the Chief.

The cover letter for the DEIS states that you intend to request an "Emergency Situation Determination" from the Chief of the Forest Service to exempt 863 acres of the timber sale from stay pursuant to 36 CFR 215.10(d).

According to 36 CFR 215.10(d), *"An emergency, as defined here, is an unexpected event, or a serious occurrence or a situation requiring urgent action. Examples of an emergency include, but are not limited to, the following:*

- (i) Vegetation loss which presents an immediate threat of flooding or landslide.*
- (ii) Hazardous or unsafe situations as a result of wildfire or other circumstances.*
- (iii) Damage to water quality caused by siltation due to fire or flooding.*
- (iv) Potential loss of fish and wildlife habitat due to windstorms and blowdowns.*
- (v) Sudden outbreaks of forest pests and diseases."*

There is no "unexpected event, or a serious occurrence or a situation requiring urgent action" within the project area. Fuels within the project area are quite low as a result of the 1999 fire, and will be so for several decades. The proposed logging will not address potential flooding, landslides, hazardous or unsafe conditions, damage to water quality, loss of fish and wildlife habitat, or sudden outbreaks of forest pests or diseases within the project area. The DEIS has not identified any substantial risk to public health or safety or critical environmental resources if post-fire logging does not proceed this year. The cover letter claims that *"failure to utilize timber harvest will lead to unreasonably high costs to complete fuels reduction through other methods utilizing appropriated dollars."* Thus, the only "emergency" is an economic one. However, 36 CFR 215.10(d) does not allow for an emergency exemption for the purpose of salvaging economic value from burned trees, as the DEIS proposes.

It is clear that there is no "emergency" within the project area that warrants such a determination. Receiving an exemption from would abuse the intent of 36 CFR 215.10(d), would seriously undermine the credibility of the Forest Service, and would prevent the public from effectively participating in the environmental review process and ensuring that applicable laws and regulations are followed.

II. FIRE, SALVAGE, FUEL BREAKS, AND FIRE SUPPRESSION

1. The DEIS fails to demonstrate that the proposed actions will achieve "community protection" objectives.

Despite the supposed objective of the entire project, the DEIS and supporting documentation fails to demonstrate how the proposed actions will in fact achieve community protection objectives. The DEIS states that "the effectiveness of this project

for providing community protection will be explained in the Environmental Impact Statement (EIS)." (DEIS at B-1). However, the DEIS fails to disclose what criteria were used to evaluate the effectiveness of the proposed actions in achieving community protection objectives, such as distance to communities.

The proposed actions are likely to be inefficient and ineffective for community protection because wildland fuel reduction on public lands does not effectively reduce home ignitability on private lands. The SRNF has not demonstrated that logging in remote, rugged locations far away from communities will be effective in protecting those communities. Home ignitability, rather than wildland fuels, has been determined to be the principal cause of home losses during wildland/urban interface fires. For example, Forest Service fire researcher Jack Cohen recently concluded that: "SIAM modeling, crown fire experiments, and wildland-urban interface fire case studies show that effective fuel modification for reducing potential wildland-urban interface fire losses need only occur within a few tens of meters from a home, not hundreds of meters or more from a home. This research indicates that home losses can be effectively reduced by focusing mitigation efforts on the structure and its immediate surroundings. Those characteristics of a structure's materials and design and the surrounding flammables that determine the potential for a home to ignite during wildland fires (or any fires outside the home) can be referred to as home ignitability. The evidence suggests that wildland fuel reduction for reducing home losses may be inefficient and ineffective: inefficient because wildland fuel reduction for several 100 meters or more around homes is greater than necessary for reducing ignitions from flames; ineffective because it does not sufficiently reduce firebrand ignitions. To be effective, given no modification of home ignition characteristics, wildland vegetation management would have to significantly reduce firebrand production and potentially extend for several kilometers away from homes." (Cohen 1999). Therefore, to most effectively protect communities at risk, fuels reduction efforts must be focused adjacent to structures and communities, not in remote locations miles from any structure. The California Department of Forest and Fire Protection (CDF) has even recently recommended that fuels treatments be focused within 200 feet of structures for maximum effectiveness in protecting communities.

With the possible exception of Waterman Ridge, we conclude that the proposed locations for salvage and fuel break construction, and fuels treatment will not achieve community protection objectives. The headwaters of Mill, Tish Tang, and Horse Linto Creeks are not appropriate areas for fuel reduction, and are not strategically located to "protect" any community. In addition, watershed, wildlife and fisheries impacts would be too high from proposed logging actions in those locations

Despite our request to analyze other locations to accomplish fuels reduction treatments for community protection, the DEIS does not do this. As the DEIS fails to meaningfully present credible criteria and evaluate alternative proposals to achieve community objectives, the FEIS must evaluate and compare the relative effectiveness of fuels reduction work in these additional areas to achieve community protection goals.

- 2. The DEIS fails to provide site-specific quantitative estimates of total and available fuel loads by timelag size class, continuity, and profile structure within units and throughout project area.***

The DEIS fails to provide site-specific information on fuels characteristics within the proposed units, instead replying on vague "tons/acre" generalizations for the entire area. This issue was not addressed in the response to public comments. This is critical deficiency in the DEIS, and needs to be corrected in the FEIS. Although extremely intense forest fires potentially can consume all aboveground biomass, normally a much lower percentage of vegetative biomass is consumed, even in stand-replacement fires (Agee 1993). For example, Fahnestock and Agee (1983) found that after a fire that had more than a 3-meter flame length, only 5 percent of stems were consumed, compared to 10 percent of branches, 100 percent foliage, 75 percent vegetation, 20 percent snag and downed logs, and 80 percent forest floor. The distribution of consumption among various vegetative and woody components obviously will differ among burned sites, depending on variables including fire intensity, topography, fuel moisture, stand composition, and structure.

The HLMTT WA, LSR Assessment, Megram Recovery Strategy, Phase I scoping document, and DEIS make numerous references to fuel loading and future fire risk within the project area and affected watersheds. However, these documents provide little quantitative documentation of past, existing, or projected fuel loads in the area. They primarily rely on qualitative speculation, and provide only general figures for overall fuels loads across the area (i.e., average tons/acre). The FEIS must provide site-specific quantitative documentation on fuels loads within each unit in order to support these statements. Some fuels are more susceptible to burning than others, the smaller diameter material being more susceptible than larger diameter material. In addition, the fuel profile greatly affects fire behavior. To estimate true fire risk in a stand, the FEIS must assess both total and available fuels in the project area by timelag size class, type, and profile. The FEIS must also compare these fuel load data with other areas closer to communities to adequately evaluate fire risk and the effectiveness of fuel reduction efforts to achieve the project's stated goals and objectives.

3. The DEIS fails to provide credible research or evidence that the project area is at an increased risk of re-burn.

There is also no documented evidence to support the claim that removal of dead trees decreases the intensity of future fire on that site (re-burn hypothesis) or the premise that post-fire logging results in no more environmental damage than typical green tree harvest (Beschta et al. 1995; Everett 1995). We can provide examples of previous fires in the Klamath region that burned hotter after post-fire salvage logging (e.g., the Yellow fire in 1987 blew up in slash left over from helicopter logging after the 1977 Hog fire on the Salmon River), but cannot find one example that demonstrates that the failure to salvage log increased the severity of a re-burn. On the other hand, inspection of previously burned areas that were not salvage logged (e.g., in Grider Creek and South Fork Trinity River) shows that un-salvaged forests are recovering fine, and do not show evidence of increased fire risk. The only demonstrated value of post-fire logging is economic and the rush to log in burned stands is strictly a matter of trying to extract the maximum amount of timber value. Current fuel loading is low in most of the burned stands in the project area and will only begin to increase after approximately ten years. Until that time, the snags and logs in burned stands play vital roles in natural recovery processes. Imposing

the severe disturbance of salvage logging and fuel break construction as proposed would put natural recovery processes at risk and cause damage to multiple ecosystem components. We request that the FEIS present credible scientific research, or provide specific example of areas within the Klamath-Siskiyou region that have burned at higher intensity or severity because of the failure to salvage log after a previous burn. It is not sufficient to assume that this is the case without credible evidence to support it.

4. The DEIS fails to provide credible research or evidence assessing the effectiveness of salvage logging and fuel breaks in reducing fire risk, particularly in the context of other factors affecting fire behavior.

Again, the DEIS fails to provide any credible scientific evidence to support the contention that salvage logging and fuel breaks will reduce the risk of fire. We request that the FEIS address this deficiency.

5. The DEIS fails to provide site-specific information on the condition of existing fuelbreaks and firelines within the project area or their relationship with the proposed salvage units and fuelbreak areas.

Although the basic premise of the proposed actions is to establish a network of fuelbreaks in the project area, the DEIS fails to identify, map, or assess the existing network of fuelbreaks and firelines within the area. Before any additional development of fuelbreaks occurs in this area, the existing infrastructure must be adequately identified and assessed.

6. The DEIS fails to analyze effects of logging and fuels treatment on microclimate and subsequent effects on fire behavior.

The DEIS fails to adequately assess the effects of proposed actions on stand-level microclimate within the proposed units, and the subsequent effects on fire behavior. Although portions of the stands have burned at high severity, the standing dead trees, especially the large ones, significantly affect stand microclimate and subsequent fire behavior. Shade provided by these standing dead trees reduce ground temperatures and increase the relative moisture of ground fuels. Large down trees provide windbreaks from surface winds and often store huge amounts of water that take heat energy out of fire (Ingalsbee 1997). Therefore, the FEIS must address this critical issue.

7. The DEIS fails to adequately analyze the impacts of salvage logging, road construction and reconstruction, fuels treatment, stand tending, and subsequent fuelbreak maintenance on natural regeneration.

The DEIS does not provide any assessment of potential impacts to natural regeneration within the proposed units. We have observed literally millions of conifer seedlings and other regeneration within severely burned stands in the Megram fire area, even within the center of large burned areas. Logging and road construction could severely disrupt several years of natural regeneration within the units, and delay site recovery for several years. The DEIS states that "Artificial regeneration (planting) will generally occur where natural regeneration does not exist (such as in center of large severity burned areas) or

where natural regeneration is impacted as a result of removing fuels" (DEIS at B-4). However, these potential impacts are not assessed. The FEIS must address this issue.

8. *The DEIS fails to demonstrate the effectiveness of the proposed actions in reducing the scale/magnitude of air quality impacts from wildfire.*

According to the DEIS, "An overall goal of the project is to reduce the scale/magnitude of air quality impacts from wildfire on adjacent communities to a more acceptable level by lowering the probability of catastrophic scale wildfires like the Megram Fire." (DEIS at II-26). - The DEIS fails to demonstrate that the proposed activities will be effective in actually accomplishing this goal. The DEIS does not provide any documented evidence to support the statement that fuelbreaks will achieve these objectives. Where have salvage logging and fuelbreaks achieved this in the past? The DEIS does not consider or address the potential contribution of smoke and associated air quality impacts from backfires and burnout activities during fire suppression activities, nor of the potential impacts from using chemical fire retardants during fire events. The FEIS must consider these questions in order to adequately address this issue.

9. *The DEIS fails to analyze how fuelbreak maintenance will be implemented, funded, and guaranteed over the long-term.*

The DEIS states that "To analyze long-term maintenance is outside the scope to this proposal." (DEIS at B-8). However, the establishment and long-term maintenance of the proposed fuel breaks is an essential component of the proposal. The overall effectiveness and efficacy of the fuel breaks depends upon their maintenance. As we have seen throughout northern California, poorly maintained fuelbreaks fill in with brush and do not serve their purpose. The overall benefits assumed to be derived from these fuelbreaks depends upon their long-term maintenance. The DEIS even uses the desired long-term condition of these fuelbreaks as a reason to claim that that there will not be significant impacts to wildlife species and will contribute to the overall goals and objectives of the project: "The long-term goal for the fuelbreaks is to achieve and maintain approximately 60-80% canopy closure. The majority of fuelbreak maintenance work will involve removal of understory components such as brush and smaller fuels."; "The desired canopy closure and understory conditions of the fuelbreaks will contribute to the overall function of LSR RC-305 to be resilient to large scale fire disturbance, provide connectivity of habitat, and contribute to the recovery and maintenance of TES species associated with late-successional forest habitat." (DEIS at IV-26). How can the DEIS make these claims without analyzing how the long-term maintenance of these fuel breaks will be accomplished, how much funding be necessary to accomplish maintenance of these fuelbreaks, and the likelihood that the Forest Service will receive the necessary appropriated funds to maintain them. What will happen if Congress does not provide the necessary funding? What will the condition of the fuelbreaks be if they are not maintained, and what will the effects be to vegetation, wildlife, and fire behavior? Will herbicides be used to maintain them if funding is not available to accomplish manual treatments? Will future timber sales be necessary to generate the funds to maintain them? In that case, additional impacts will occur, and the stated prescriptions for their maintenance will not be followed. We have seen this situation in recent years on the Shasta-Trinity NF. A similar situation has occurred with the Forest Service road system.

The Forest Service has simply built more roads than it can adequately maintain, and created a significant problem on the landscape. How can we be assured that a similar situation will not occur with the creation and establishment of an extensive network of fuelbreaks which require consistent care and tending? The long-term maintenance of these fuelbreaks is central to the question of their potential impacts and theoretical benefits. Therefore, it is essential that this issue be addressed in this analysis. If the fuelbreaks are not maintained, and if the FEIS does not address this issue, then the supposed benefits from their establishment are questionable at best, and raises serious doubts about the validity of the claims made in the DEIS about their effectiveness.

10. The DEIS fails to disclose the direct, indirect, and cumulative effects of fire suppression and exclusion, including fire suppression and rehabilitation activities.

The DEIS does not provide an adequate discussion or assessment of the direct, indirect, and cumulative effects of fire suppression, fire exclusion, and fire suppression and rehabilitation impacts in the project area. For example, how many snags and "hazard trees" were removed from the area during the Megram fire? What roads were reopened, and what was their effect? What areas were intentionally burned by firefighters during the Megram fire, and are any of these areas now proposed for logging? What were the effects of chemical fire retardants in the area. these and other impacts associated with past, and future fire suppression activities must be addressed. Also, the proposed project commits the SRNF to a fire suppression strategy in the area. What will be the direct, indirect, and cumulative effects be of continued fire suppression and exclusion in the area? The FEIS must address these critical issues.

11. The DEIS fails to adequately address firefighter safety.

The DEIS states that "Firefighter safety is not a "connected" or "similar" action with this proposal and therefore is outside the scope of analysis for this project." (DEIS at B-10). However, it also states that "The intent of the proposal is to develop areas that allow for safe suppression activities while restoring natural ecological systems in the long-term, and to minimize uncharacteristically intense fires." (DEIS at B-11). If the proposed actions are intended to "allow for safe suppression activities" then why is firefighter safety not considered in the evaluation of those actions? The FEIS must address this issue.

12. The DEIS fails to consider a non-commercial alternative that reduces hazardous surface and ladder fuels through manual treatment of small-diameter materials and prescribed burning.

The DEIS rejects our request to consider a non-commercial alternative that reduces hazardous surface and ladder fuels through manual treatment of small-diameter materials and prescribed burning, stating: "Removal of large diameter fuels is important for meeting the purpose and need for this proposal. Manual treating all fuels and eliminating removal large fuels would not meet the purpose and need for the action." (DEIS at B-14). However, there is no evidence or documentation to support the contention that this alternative would not meet the purpose and need for action. We believe that the DEIS

fails to provide sufficient reason, documentation, and justification to reject consideration of such an alternative.

The proposal to remove large woody material in a commercial timber sale is not consistent with current Forest Service management direction. For example, the National Fire Plan states: "Notably, the Administration's wildland fire policy does not rely on commercial logging or new road building to reduce fire risks and can be implemented under its current forest and land management policies. The removal of large, merchantable trees from forests does not reduce fire risk and may, in fact, increase such risk. Fire ecologists note that large trees are "insurance for the future – they are critical to ecosystem resilience." Targeting smaller trees and leaving both large trees and snags standing addresses the core of the fuels problem." (Managing the Impact of Wildfires on Communities and the Environment - A Report to the President in Response to the Wildfires of 2000).

Reinforcing this position, the Forest Service Cohesive Strategy states: "In most cases, any receipts associated with treatments will not be significant due to the need to reduce the disproportionately large number of small, non-merchantable trees, brush, and shrubs that dominate short interval fire-adapted ecosystems and leave standing the larger, fire-tolerant trees." (Protecting People and Sustaining Resources in Fire-Adapted Ecosystems – A Cohesive Strategy, 2000).

Commercial logging, particularly helicopter yarding, removes the least flammable of the forest fuels. Fuel treatments should focus on the most flammable of the forest fuels, such as brush, weeds, and the lower branches of understory trees to remove ladder fuels. It is clear that the timber sale contract is not an adequate or appropriate tool for meaningful restoration and fuels reduction. The FEIS should consider a non-commercial alternative that focuses on small-diameter material to achieve these objectives.

III. VEGETATION AND STAND CONDITIONS

1. The DEIS does not provide site-specific vegetation and stand conditions in terms of vegetative cover, down logs and snags, environmental conditions, soil conditions, regeneration, and residual tree species and densities.

The DEIS does not provide sufficient site-specific information on numerous characteristics associated with vegetation and stand conditions within the proposed units. Instead, it relies on general information on conditions and characteristics within the affected watersheds. Detailed site-specific information on vegetative cover, down logs and snags, environmental conditions, soil conditions, regeneration, and residual tree species and densities is necessary in order to properly evaluate the proposed activities. For example, the DEIS states that stands within the proposed units are all areas that "burned with high severity." (DEIS at B-9). However, the Interdisciplinary Team Meeting notes (10-10-2000) indicate that several of the units have green trees and unburned patches within them. While we have not been able to visit each proposed unit due to snow and access issues, we have observed differences in structural conditions, burn severity, residual tree densities, regeneration densities, etc. Also, the DEIS does not describe the pre-fire stand conditions within the proposed units. The SRNF GIS vegetation data indicates that a majority of the proposed units were late-mature or old-

growth before the Megram fire (approximately 195 acres of old-growth and 200 acres of late-mature burned stands are within the proposed units, or 37% of the total project area). These stands, although severely burned, still retain tremendous structural diversity and legacy remaining, as well as green trees and moderately burned patches. They are far from the "shrub/forb" stage that the SRNF like to portray them as. This has tremendous implications for potential impacts, site recovery, and species presence and utilization of the stand. This site-specific information must be included and assessed in the FEIS in order for the public and interested parties to evaluate the proposed actions.

IV. WATER QUALITY AND BENEFICIAL USES

We are concerned about potential impacts to water quality and beneficial uses from the direct, indirect, and cumulative effects of the proposed timber sale. The DEIS fails to provide sufficient site-specific information, analysis, or documentation on potential impacts to water quality from the proposed actions, in combination with past, present, and reasonably foreseeable future actions in the project area. The DEIS also makes numerous unsubstantiated and unsupported conclusions and assertions regarding potential impacts from proposed activities. In summary, the DEIS fails to adequately analyze potential impacts on beneficial uses resulting from erosion and sediment delivery, loss of large woody debris, altered hydrology, altered temperature regime, and altered nutrient cycling caused by the project. Therefore, we conclude that the DEIS fails to demonstrate that applicable water quality standards and objectives set forth in the federal Clean Water Act and the Porter-Cologne Water Quality Control Act will be met.

The DEIS asserts that the proposed logging of 1,050 acres, construction or reconstruction and decommissioning of over 3 miles of temporary road, and construction of an unknown number of landings will decrease the potential erosion in the watershed. We fail to see how such an extensive amount of vegetation and ground disturbance would not adversely affect soils and water quality.

According to the DEIS, estimates of potential sediment delivery "are primarily based on predicted levels of ground cover following all treatments." (DEIS at S-7). The theory assumes that salvage logging can reduce erosion through scattering logging slash across the logged area to reduce rainfall impact and surface flow. This environmental indicator does not adequately address potential impacts from the logging and other proposed activities, including soil compaction and displacement, that influence potential erosion at the site.

We have the following specific concerns regarding water quality and beneficial uses:

- 1. The DEIS fails to analyze potential soil compaction, displacement, and erosion from logging, burning, road construction and reconstruction, fuel break construction and maintenance, and landing construction.***

The DEIS fails to completely identify and analyze all potential impacts from the proposed activities on soil and subsequent erosion. Most importantly, the DEIS fails to assess potential soil compaction and displacement from the proposed actions. Consider the following quotes:

"Sediment delivery from other forest activities [other than roads], including harvest, yarding, and site preparation, may be increased via several mechanisms. ... Yarding activities cause extensive soil disturbance and compaction which may increase splash erosion and channelized runoff. Ground-based vehicles moving logs from felled trees and skidding logs to landing sites compact and scarify the soil. Compaction of the decomposing root systems reduces the infiltration capacity of these channels, leading to slumps, landslides, and surface erosion (Everett et al. 1987)." (Spence et al. 1996).

"Soil compaction by ground-based equipment can reduce infiltration of water, thereby hindering the reestablishment of seedlings or the growth of established vegetation. In addition, as tree roots die after logging, subsurface spaces (macropores) become compacted or filled with sediment, reducing infiltration of water and reducing aeration in the soils. When porosity is reduced below 20-25%, root growth is retarded." (Spence et al. 1996)

"Forest practices can result in significant disturbance to soils, including increased compaction, scarification, and mixing of soil layers. The degree and effects of compaction are influenced by a number of factors, including the total area compacted, the soil type and moisture content, the equipment used, and the number of passes the vehicle makes over the site. The effects of soil compaction appear to be of long duration.... Duration of compaction depends upon depth of compaction, soil texture, soil temperature, and moisture regimes, and biological activity." (Spence et al. 1996)

The DEIS fails to adequately identify and analyze potential significant long-term impacts from soil compaction and displacement resulting from the proposed activities.

2. The DEIS fails to adequately assess potential for channelized erosion and effectiveness of mitigation measures, including IRR buffers, in preventing erosion and sediment delivery to stream channels (including existing conditions in IRRs).

The DEIS relies on riparian reserves to filter sediment generated from upslope soil disturbance. It is assumed that ground disturbance in sensitive or steep areas outside of these buffer zones will not result in sediment delivery to stream channels. The DEIS assumes that surface erosion will be insignificant if post-logging soil cover is adequate to reduce rainfall and splash erosion. However, this assumption is questionable, and is not supported in the scientific literature. Consider the following:

"The quantity of sediments delivered to the stream channel depends upon the integrity of the riparian zone, the intensity of disturbance, the areal extent of the disturbance, the proximity of the disturbance to the stream channel, and slope steepness." (Spence et al. 1996).

"Most surface sediments that reach stream channels result from channelized erosion (rilling and gullyng) and sheet erosion (Brown 1980; Swanston 1991). Channelized erosion occurs when flows are concentrated and restricted by landforms, usually following heavy storms or snowmelt (Beschta et al. 1995). It is considered the most significant form of surface erosion on forest lands (Brown 1980). Although uncommon in

undisturbed forested situations, rills may occur when infiltration capacity is reduced (Megehan 1991). In contrast, nonchannelized erosion develops from detachment begun by raindrop-splash and wind movement of dry particles (dry ravel). These processes generally occur on exposed soils and tend to remove soil uniformly over an exposed area. sheet erosion tends to be of greater significance on low-gradient agricultural lands than on forested lands, whereas dry ravel occurs on steep slopes in soils lacking cohesion (Swanson et al. 1987; MacDonald and Ritland 1989)." (Spence et al. 1996).

"The regulation of sediment flow is a major function of the riparian zone. Riparian vegetation and downed wood in the riparian zone can reduce the amount of sediment delivered from upland areas to the stream channel in several ways. By providing physical barriers, standing or downed vegetation can trap sediments moving overland during rainfall events. Riparian zones, however, are less effective in regulating channelized erosion. Most surface erosion occurs in channelized flows that may travel thousands of feet (Belt et al. 1992; O'Laughlin and Belt 1994). Thus, riparian vegetation may have little influence on sediments derived from outside of the riparian zone." (Spence et al. 1996).

"The zone of riparian influence for sediment regulation is difficult to define because of different ways sediment may enter the stream channel. The FEMAT (1993) review of the literature suggests that riparian zones greater than 200 feet (i.e. about one site-potential tree height) from the edges of the floodplain are probably adequate to remove most sediment from overland flow. However, O'Laughlin and Belt (1994) suggest sediment control cannot be achieved through riparian zones alone because channel erosion and mass wasting are significant sources of sedimentation in forested streams. For these events the zone of influence may extend several hundred meters from the floodplain (FEMAT (1993), depending on the soil type, slope steepness, and other factors that influence the susceptibility of hillslopes to mass wasting or channelized erosion." (Spence et al. 1996).

"Belt et al. 1992 provide a thorough review of studies examining sediment transport below roaded areas on forested soils and drew four conclusions related to riparian buffer strip design: 1) riparian buffers should be greater where slopes are steep, 2) riparian buffers are ineffective in controlling sediments resulting from channelized flows that originate outside of the riparian buffer, 3) sediments rarely travel more than 91 m, unless flows are channelized, and 4) removal of natural obstruction to flow - vegetation, woody debris, rocks, etc. - within the buffer increased the travel distance of sediments." (Spence et al. 1996).

"On gentle slopes, buffers of 30 m may be sufficient to filter sediments, whereas on steeper slopes, buffers of 90m or more may be needed. In addition, riparian buffers are most effective in controlling sediments from sheet erosion and have less influence on sediments that reach the stream channel via channelized flow (Broderson 1973; O'Laughlin and Belt 1994; Murphy 1995)." (Spence et al. 1996).

"...activities within the riparian zone that disturb or compact soils, destroy organic litter, remove large down wood, or otherwise reduce the effectiveness of riparian buffers as sediment filters should be avoided." (Spence et al. 1996).

The DEIS fails to adequately assess the potential erosion and sediment delivery from all activities within the project area, and the effectiveness of riparian zones to adequately prevent sediment delivery to stream channels. Both upslope and riparian areas in severely burned stands are deficient in large woody material, litter, duff, and vegetation, compromising their ability to adequately filter sediments. The proposed removal of existing and recruitment LWD from these sites further compromises their ability to filter sediment. The DEIS fails to consider these potentially significant impacts from the proposed actions, and fails to adequately evaluate the effectiveness of project design features and mitigation measures in protecting water quality.

3. The DEIS fails to analyze the potential soil disturbance and soil erosion from all yarding systems.

The DEIS incorrectly assumes that significant soil disturbance and erosion will only occur in tractor logging systems ("The environmental indicator used to measure effects of... skid trails and estimate the differences among alternatives include ...acres of tractor logging relative to slope class and position." DEIS at IV-5; "Helicopter yarding is typically employed instead of cable on units with steeper terrain or indications of existing or potential erosion problems." *Id.* At IV-3; "Sensitive terrain will be logged by cable or helicopter, and tractor logging is restricted to slopes less than 20%." *Id.* At IV-16).

However, several studies have demonstrated increased soil disturbance and erosion as a result of salvage operations using a variety of yarding methods (Swanson, et.al., 1989). While helicopter and cable yarding systems generally result in less soil disturbance than tractor yarding, they are not without impacts that must be addressed. For example, Klock (1975) compared five different post-fire salvage logging methods on a *P. ponderosa* site in eastern Washington. There were distinct differences in soil disturbance and erosion from the various logging systems. However, even with helicopter logging (the least disturbing method) 12% of the logged area soil was disturbed. Conventional tractor systems disturbed almost 75% of the area and caused erosion on over 30% of the area. Other studies have demonstrated adverse soil structure effects from logging that increase erosion (Steinbrenner and Gessel, 1955) and reduce reforestation success (Garrison and Rummell, 1951). Dyrness (1972) and Woolridge (1960) evaluated effects on soil from logging with low impact systems (balloon and skyline). Both researchers noted damage to the soil. None of these studies noted any beneficial effects to the soil from logging.

The FEIS must address the potential soil disturbance and soil erosion in all proposed yarding systems.

4. The DEIS fails to analyze impacts on hydrology from logging, burning, road construction and reconstruction, fuel break construction and maintenance, and landing construction (especially peak flows during rain-on snow events).

The DEIS fails to analyze impacts on hydrology from the proposed actions. The project area is located within the transition rain-on-snow zone, and is susceptible to increased peak flows. The potential impacts from the proposed actions on hydrology have not been assessed in the DEIS, particularly in combination with sediment impacts and alteration of

LWD loading and recruitment. According to Appendix C-1, C-2, and C-3 of the BA/BE for PETS fish species for the proposed project, peak and base flow indicators are at risk in Horse Linto Creek, and are not properly functioning in Mill, Sharber, and Quinby Creeks. Given this situation, the DEIS must rigorously identify and evaluate all potential impacts to hydrology from the proposed actions.

5. *The DEIS fails to adequately assess impacts on nutrients from logging, burning, road construction and reconstruction, fuel break construction and maintenance, and landing construction.*

The DEIS fails to identify potential impacts on nutrient cycling and input into the stream system from the proposed activities. This issue must be adequately addressed in order to demonstrate that water quality objectives will be met.

6. *The DEIS fails to analyze or provide sites-specific information on pre- and post-project downed woody debris levels and its' influence on soil erosion and delivery.*

The DEIS fails to provide site-specific information and analysis on existing down woody material within the proposed units, and how the project will affect these critical landscape elements. This information is necessary in order to adequately evaluate all potential impacts to water quality and long-term site productivity in the area.

7. *The DEIS fails to provide sufficient information or documentation on erosion and sediment modeling and analysis - ULSE, WEPP, ERA model assumptions and data inputs (e.g. coefficients, thresholds of concern).*

The DEIS fails to provide adequate information or documentation on the erosion and sediment modeling methods used. For example, no data or documentation is provided on the derivation or the ERA values and coefficients displayed in Tables 4-5 and 4-6 (DEIS at IV-13, IV-15). This information is critical in order for the public and other interested parties to evaluate the validity of the methods, the input data, and the correct application of the models. The FEIS must provide more thorough documentation of the assumptions on the erosion and sediment modeling and analysis.

8. *The DEIS fails to adequately to assess CWEs.*

The DEIS fails to disclose the data or methods used to determine the CWE rating system (DEIS at IV-12, Table 4-4), or that were used to define ERA impact mechanisms, coefficients, and thresholds (DEIS at IV-10, IV-13, IV-14, IV-15). It appears that these values are not based on monitoring or other empirical data, but are arbitrarily defined. Also, all past, present, and reasonably foreseeable future actions have not been analyzed. In addition, the ERA method is technically flawed and is incorrectly applied in the DEIS. Consider the following:

From Reid, 1998 (Chapter 11 - CWEs and WA, in "River Ecology and Management")

"Administratively, the ERA method is convenient and useful. ...Unfortunately, the method contains flaws that undermine its technical adequacy. For example, coefficients

for recovery refer to recovery at the site of land use but not to recovery from the off site impacts of that activity. ...In addition, because only one set of coefficients is used to describe each activity, the method implicitly assumes either that only one mechanism for impact is possible in an area or that some composite variable is meaningful. However, a tractor logged slope might be very much like a road in terms of sediment production but very different in terms of hydrologic change. If both hydrologic and sediment impacts are of concern, then two different sets of coefficients should be used to compare roads and logging. ...Other problems arise from the manner in which the ERA method is applied. for example, the procedure requires calibration of many coefficients for each area, and such calibration ordinarily would be based on a lot of monitoring data for each activity. Monitoring is expensive and time-consuming, however, so the necessary coefficients are usually estimated using professional judgement. This approach might not present a problem if the results of activities were then monitored to test the predictions, or if the entire program were tested by statistical comparisons between prediction and reality, but no such monitoring has been carried out. Furthermore, those applying the method rarely specify the impact mechanisms important in the area of application. ... These considerations suggest that the apparent simplicity of the index approach is deceptive. To use such and approach appropriately would require that different indices in impacts, impact mechanisms, and recovery trajectories. appropriate use would also require a tremendous monitoring effort both to calibrate the method for a variety of conditions present and to test the validity of the results"

From Beschta et al., 1995 (Cumulative effects of forest practices in Oregon: literature and synthesis)

"Many of the historically utilized approaches to cumulative effects assessments of water resources involved designating an arbitrary limit or threshold. This threshold typically represented a specific percentage of the watershed area that could be affected by a particular forest practice within a specified time period. In many cases, the threshold was defined as the percent of the basin area harvested at which a significant shift in system behavior (such as change in peak flow) was expected to occur. Unfortunately, there is often insufficient data available to support limitations on the amount of basin harvesting that occur at any one time nor is there good evidence or an agreed upon procedure for determining what the magnitude of those limitations or thresholds should be. Other problems of current cumulative effects methodologies is their general emphasis on peak flows as the driving force behind downstream channel changes ... In addition, there is very little allowance made in many methods for natural variability amongst basins. Finally, many cumulative effects methods fail to identify monitoring needs that will confirm whether cumulative effects goals are being attained."

Beschta et al. (1995) identified several conditions necessary for accurate analysis of cumulative watershed effects, including: (1) accurate understandings of natural variation in the local environment; (2) reliable baseline information at the local and regional scale (ideally from "reference" sites); (3) accurate assessments of the probable effects on key resources of past, present and foreseeable future activities; (4) development of reliable models that relate resource conditions within a dynamic spatial framework; and (5) establishment of levels of acceptable change in the environment.

The DEIS does not provide a defensible CWE assessment. The DEIS does not address or provide information to address the criticisms and concerns and provide adequate information noted above by Reid (1999) and Beschta et al. (1995). The FEIS must address these issues in order to adequately assess CWEs in the affected watersheds.

9. The CWE assessment fails to adequately address all past, present, and reasonably foreseeable future actions in the affected watersheds.

The CWE assessment does not adequately analyze all past, present, and reasonably foreseeable future actions in the affected area, in violation of NEPA. Actions and impacts that are not adequately addressed include logging and road construction on the Hoopa Valley Indian Reservation; salvage logging in 1997-1999 following the blowdown event; fire suppression activities during the Megram Fire; impacts from the Happyman Plantation Project logging in 2000; the potential impacts from logging the Megram Hazard Tree Project; activities outlined in the Phase II and "Megram Recovery Strategy", grazing in the affected watersheds, and future fire suppression activities. The failure to analyze all of these impacts renders the CWE assessment inadequate. The FEIS must address all of these impacts in order to adequately address CWEs in the affected watersheds.

10. The DEIS fails to assess potential impacts from stored oil, hydraulic fluid, and other hazardous materials.

The DEIS states that "Stored oil, hydraulic fluid, and other hazardous materials may be spilled on the ground or in streams and affect water quality. The possibility of a spill and the potential contamination of nearby water sources exist when these materials are stored within the project area" (DEIS at I-9). However, this issue is not carried forward in the analysis. There is no information presented on the types or amounts of hazardous materials that may be stored within the project area, what risks exist from this situation, what potential water quality impacts may result from this situation, or what mitigation measures will be implemented to ensure these impacts do not occur. Finally, there is no information or analysis presented that addresses chemical fire retardants and their effects on water quality and beneficial uses. Potential impacts from these hazardous materials must be addressed in the FEIS.

12. The DEIS fails to identify and disclose the site-specific location and protective measures of all seeps, springs, wetlands, ground-water influence zones, and unstable and potentially unstable lands as IRR's.

The DEIS fails to provide site-specific information and analysis of riparian reserves within the project area, including unstable and potentially unstable areas, seeps, springs, ponds, bogs, wet meadows, and stream channels.

Any logging or soil disturbance in these high risk zones could accelerate landslide movement. The NFP requires Riparian Reserves to be allocated around "the extent of unstable and potentially unstable areas (including earthflows)." (ROD at C-31). All Riparian Reserves must be adequately identified in order to ensure that any action taken to reduce fire hazard meets special guidelines and the Aquatic Conservation Strategy

(ACS) objectives. According to SRNF GIS geomorphic data, several proposed units are located in headwall basins and other potential unstable areas. We request that the FEIS discuss how the decision to enter these areas was made, and to explain what criteria was used to determine that it is safe to log these areas. Given the *risk* that proposed activities on unstable ground would trigger landslides, the Forest Service must provide site-specific information that supports its conclusion that such activities would “reduce” risks to slope stability. This must include analysis of the precise locations of proposed fuel management and the relative distributions of such locations on the landscape.

13. The DEIS fails to provide or analyze site-specific information on soil type, slope, and soil cover for each proposed unit.

This site-specific information is necessary to properly evaluate the proposed actions. It is not sufficient to provide average values for the entire watershed, or average values for all units. The FEIS must provide site-specific information for each unit in order for the public and other interested parties to assess potential impacts from the proposal and adequacy of proposed mitigation measures and project design features.

14. The DEIS fails to provide site-specific information and analysis of effects from proposed temporary road construction and reconstruction/reopening, as well as landings.

The DEIS does not provide site-specific information on the locations, slopes, design specifications, existing condition, length of time road will be in place and operational (how long until decommissioning), potential impacts from decommissioning, whether they occur in IRRs, temporal impacts and effectiveness of mitigation in removing all impacts from road. The maps provided in the DEIS do not show locations of proposed roads or landings, or their relation to IRRs (including wet areas, unstable lands, and streamcoarces). The DEIS mentions that new drainage structures will not be required for the temporary roads (DEIS at IV-5), but does not disclose if there are any existing drainage structures associated with any of the roads that would be reopened or reconstructed. The DEIS states that "diverted road drainage in the project area is also extremely rare in this part of the Forest." (DEIS at IV-5). However, we have observed numerous locations in the project area with diverted road drainage, such as on roads in the East Fork Horse Linto Creek watershed and the headwaters of Mill Creek watershed. The DEIS fails to provide site-specific information and analysis of effects for the proposed road construction. The DEIS also fails to disclose the potential environmental effects of temporary roads. What are the differences between permanent roads and temporary roads? Even temporary roads result in impacts to the soil and site productivity, including soil structure, microorganisms, and reestablishment of vegetation. Also, landing construction produces similar environmental impacts. What methods and equipment will be used to decommission the roads and landings, and will they adequately mitigate these impacts? Considering that roads contributed more sediment than all other forest activities combined on a per unit area basis (Furniss et al. 1991), this information and analysis is critical for proper evaluation of potential impacts, and for the public to evaluate the proposed actions, mitigation measures, and project design features.

15. The DEIS fails to provide an alternative for addressing potential erosion from burned sites.

The Forest Service can accomplish erosion control and watershed restoration objectives without logging. The SRNF has implemented numerous erosion control projects within the Megram fire area. If this is indeed a driving concern for the watershed (i.e. restoration), then the FEIS needs to consider an alternative which addresses potential erosion from burned sites without a commercial timber sale which has numerous potential adverse environmental effects.

16. The DEIS fails to identify and limit all "controllable water quality factors" associated with the proposed project.

The project area is located within the Trinity River watershed, which is listed as impaired due to excessive sediment under Section 303(d) of the Federal Clean Water Act. The Trinity River and its tributaries are also part of an Evolutionary Significant Unit for which Coho salmon have been listed as endangered under the Federal Endangered Species Act. Due to the impaired condition of the Trinity River and its tributaries, any discharge or threatened discharge from project operations that are not reasonably controlled in the watershed are considered to be in quantities deleterious to the beneficial uses in violation of the Basin Plan prohibitions. This project must therefore protect the watershed from further inputs of sediment from controllable sources and efforts must be made to restore any impaired beneficial uses.

The Basin Plan also states that “*controllable water quality factors shall conform to the water quality objectives contained herein. When other factors result in the degradation of water quality beyond the levels or limits established herein as water quality objectives, then controllable factors shall not cause further degradation of water quality. Controllable water quality factors are those actions, conditions, or circumstances resulting from man’s activities that may influence the quality of the waters of the State and that may be reasonably controlled.*”

Controllable water quality factors include actions, conditions, and circumstances resulting from salvage or other activities. "Controllable" factors include, but are not limited to: significantly reducing the size of the timber sale; deferring logging and road construction; operating in other locations (e.g., close to communities, in unburned stands); prohibiting winter operations; and addressing watershed restoration needs and fuels reduction through other non-commercial activities. The DEIS does not identify and implement all reasonable "controllable" water quality factors, and hence fails to demonstrate that the proposed actions will meet water quality standards and objectives set forth in the Clean Water Act and Basin Plan.

17. The DEIS fails to identify any significant or sensitive features or special considerations for conducting management activities in severely burned sites.

The DEIS (and supporting documentation) fails to provide adequate information on how the Megram fire has affected the ability of soils and slopes within severely burned sites to respond to logging and road construction? How well does a severely burned site with

little to no ground vegetation, decreased litter and duff, decreased downed woody debris, and decreased infiltration capacity prevent sediments from being transported to stream channels? The FEIS must address potential environmental conditions in severely burned areas that require special management consideration.

18. *The DEIS assumptions about BMPs and mitigation are flawed.*

The DEIS assumes that water quality will be protected if BMPs and mitigation measures are implemented. However, while prevention of minimization of adverse impacts at the project site is indeed necessary, it is not sufficient to avoid cumulative effects (CEQ 1971). The argument that applying a BMP while conducting a specific forest practice minimizes site specific effects and thus also minimizes cumulative effects is logically flawed. Every BMP is an action and has an effect. Thus generally, the more the BMPs are applied, the greater the cumulative effect. Only by minimizing the number of actions, i.e., the number of individual applications of BMPs, would cumulative effects be minimized (Beschta et al. 1995). However useful BMPs are in minimizing effects of individual actions, they still do not address the cumulative effects of multiple actions occurring in the watershed which, though individually "minimized" through application of site-specific BMPs, may still be significant and have undesirable consequences for beneficial uses such as clean water and fish habitat. The FEIS must address the potential cumulative effects associated with all potential activities, despite the implementation of BMPs and other mitigation measures.

V. SOILS

We remain concerned about the impacts of salvage logging, fuels treatment, and road construction on burned soils, particularly soil productivity, nutrient cycling, and recovery processes, especially from multiple entries in an area. Overall, intense wildfire tends to increase the sensitivity of sites to further soil disturbance (Helvey 1980, Morris and Moses 1987). Skid trails formed in postfire stands can influence productivity of trees growing directly on them (Smith and Wass 1980). Logging activities should be prohibited in severely burned areas (areas with low amounts of litter), on erosive sites (e.g. granitics), on fragile soils, in roadless areas (inventoried and non-inventoried), in riparian areas, on steep slopes, or on any site where accelerated erosion is possible. The DEIS fails to provide sufficient site-specific evidence that the proposed logging will not result in significant impacts to soils in the area. The FEIS needs to provide more thorough analysis and documentation of potential effects from the proposed actions.

The DEIS' assertions that salvage logging is beneficial for forest health in general, and in preventing soil erosion and sedimentation in particular, is reflective of a general lack of scientific integrity and methodology throughout the DEIS and administrative record. No reference is provided in support of these assertions, which is especially problematic given the ample science which directly contradicts them. For example, erosion and sedimentation, and the accompanying loss of soil nutrients, are acknowledged to be major issues in salvage logging operations (Klock 1975, Marton and Haire 1990, Minshall et al. 1994, Beschta et al. 1995). As a result of the Forest Service's inexplicable conclusion that salvage logging is beneficial the adverse cumulative effects of the

Megram fire and the proposed logging operations on the watersheds within the analysis area are completely overlooked in violation of NEPA.

The above conclusion is further strengthened by the substantial body of scientific literature which has found that fire salvage operations are extremely detrimental to forest health, soils, and watershed. In fact, it has been strongly recommended that salvage logging be prohibited in sensitive areas, including severely burned sites such as the proposed project area, or in any site where accelerated erosion is possible (Beschta, 1995). Additional scientific literature exists which has found that salvage logging increases soil erosion, thereby increasing sedimentation, soil compactions, and the loss of soil nutrients. (Klock 1975, Marton and Haire 1990).

Even more specific to the proposed actions, the Beschta report recommends the prohibition of tractors and skidders in salvage areas because of the exacerbated soil compaction and erosion problems they create on sensitive soils. The report also advises prohibitions on road building and reseeding in salvage areas, both of which are proposed in the DEIS. More fundamentally, Beschta found that there is no ecological need for intervention (i.e. logging) on post-fire landscapes and that a 'hands off' approach should be much more the exception rather than the rule. Despite the widely acknowledged view that salvage logging adversely affects forest soils, the DEIS fails to substantively address, or even acknowledge, any such possible consequences.

1. The DEIS fails to analyze impacts to soil structure and productivity from soil compaction and displacement.

According to the DEIS, "The percentage of soils covered with woody material after fuel treatments are used as the indicator of potential damage to soils and loss of soil productivity." (DEIS at II-28). This does not account for or assess potential impacts to soil structure and productivity from compaction or displacement, and does not address potential impacts to nutrient cycling, or soil flora and fauna (e.g. mycorrhizae) which are critical to long-term site productivity. The FEIS must address all potential impacts to the soil and long-term site productivity.

The inadequacy of this analysis is especially pronounced with respect to the combined effects of the fire and the proposed logging. While the DEIS makes mention of the potential erosion and sedimentation problems which have occurred since the Megram fire, there is no meaningful discussion concerning the increased sedimentation and erosion which will result from the logging of 1,050 acres of trees in high intensity burn areas. Instead, the Forest Service asserts, without scientific justification or reference, that the proposed salvage logging will actually help forest soils and decrease erosion and sedimentation problems.

The potential impacts from compaction have long-term consequences to the site. Consider the following: "Minimizing soil compaction helps maintain healthy populations of soil organisms by preserving soil structure.... Pore space is essential for the movement of oxygen and water into soil and the flushing of carbon dioxide out of it; microbial activity is drastically altered when levels of these basic elements become extreme. Undisturbed forest soil is rarely saturated because large pores allow for rapid downward

percolation of water. However, when soils are compacted, large pores are destroyed and water movement through soil is reduced. Soil compaction greatly influences the types and activities of soil organisms sensitive to excess soil moisture. Thus, the adverse response of plants to compaction reflects both indirect effects on microbes and direct effects on the plants themselves. Careful selection and skillful implementation of harvest methods to minimize compaction increase the potential for long-term maintenance of beneficial soil organisms." (from *Long-Term Forest Productivity and the Living Soil* by M. P. Amaranthus, J. M. Trappe, and R. J. Molina).

The FEIS must address these critical issues.

2. *The DEIS fails to analyze impacts to soil structure, function, and productivity from removal of large high value trees.*

We remain concerned that the removal of large high value trees in salvage operations subsequent to the fire may permanently damaged site productivity by removing essential large woody material. Consider the following:

"Woody debris is a dynamic component of the forest soil. It provides a storehouse of moisture and is an energy source and refuge for microorganisms critical to forest productivity. Mycorrhiza activity is significantly greater occurs in decaying wood than soils (Harvey et al. 1979). The relative importance of woody debris in supporting feeder roots may be greater on dry sites than on moist sites. During periods of adequate moisture, humus supports the highest level of ectomycorrhiza activity; but during periods of drought, soil wood becomes the most active site (Harvey et al. 1986). Thus, the wood component appears most important on low-productivity sites where moisture is limited or where natural levels of woody debris are low.

Wood on the forest floor forms long-lasting, moist microsites that may aid forest recovery. Following intense wildfire in southwest Oregon, decaying logs retained 25 times more moisture than surrounding soil (M. P. Amaranthus, D. Parrish and D. A. Perry, manuscript in preparation, Oregon State University, 1988). Such decaying logs may expedite forest recovery by providing important refuge for roots and associated mycorrhizal fungi of pioneering vegetation.

Because most forest stands of the Pacific Northwest appear nitrogen limited, any factor affecting inputs and storage has implications for long-term productivity. Although the amount of nitrogen in sound stemwood may be small compared to that stored on the total site, decaying wood acts as an important locale for asymbiotic nitrogen fixation. Over the long residence time of large wood, inputs and storage of nitrogen are significant for some sites (Larsen et al. 1980, Harvey et al. 1986).

"Protecting or enhancing the organic matter in Northwest forest soils is a primary means of maintaining long-term forest growth. Woody debris is a critical component of this organic fraction. The longterm ability of a soil to retain moisture, as well as ectomycorrhizal and nitrogen-fixing organisms, depends upon the continuing input of organic matter. Substantial losses of organic matter, including large wood, from thin, droughty, or infertile soils may result in long-term losses of forest productivity." (from

Long-Term Forest Productivity and the Living Soil by M. P. Amaranthus, J. M. Trappe, and R. J. Molina).

Larger woody material persists longer on site, and provides more ecological benefits to the site. Leaving small-diameter logging slash behind to address ecological needs of the site is insufficient. The DEIS fails to address the significant issues related to the removal of large-diameter materials from the site, and ensure that soil processes and long-term site-productivity are protected. The FEIS must correct this deficiency.

VI. FISHERIES

1. The DEIS fails to adequately assess potential impacts to Proposed, Endangered, Threatened, and Sensitive (PETS) fish species.

Because of the above listed concerns and issues related to soils, erosion, sediment delivery, and subsequent effects to the aquatic system, we do not believe that the DEIS and administrative record adequately address potential impacts to PETS fish species. The watersheds in question are critical to anadromous fisheries in the Trinity River basin, particularly Horse Linto Creek. We do not believe that the proposed actions are consistent with the protection and recovery of these fisheries. The DEIS fails to provide sufficient evidence and documentation that the proposed logging and road construction will not adversely affect fish species in Mill, Horse Linto, Quinby, and Sharber Creeks.

The BA/BE for fish determined that the proposed actions may affect but will "not likely adversely affect" (NLAA) listed coho salmon. According to NMFS' management direction, a NLAA determination can only be made "when effects on the species or critical habitat are expected to be beneficial, discountable, or insignificant... and should never reach the scale where take occurs". According to NMFS' direction, a "likely to adversely affect (LAA) determination is reached "when there is more than a negligible potential to have adverse effects on the species or its critical habitat... as a direct or indirect result of the proposed action or its interrelated or interdependent actions" (*Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale, August 1996*).

It is clear that the proposed actions have a high likelihood of adversely affecting water quality, critical habitat elements, channel conditions and dynamics, hydrologic function, and overall watershed condition within the analysis area. The proposed actions will certainly have more than a "negligible potential" to cause take of individual eggs and/or fish and adversely affect critical habitat for coho salmon in both the short- and long-term, thus warranting a LAA determination. It appears that the NLAA determinations have not been made after a careful and honest evaluation of potential direct, indirect, and cumulative effects of the proposed projects. Instead, the NLAA determinations appear to be based on a desire to move the two projects forward by circumventing the February, 2000 federal directive that prohibits NMFS from issuing new Biological Opinions on timber sales that are "likely to adversely affect" listed fish species or their critical habitat.

The DEIS and BA/BE for fish do not adequately address all potential cumulative effects associated with the proposed project, in combination with all past, present, and

foreseeable future actions within the affected watersheds. Of particular note, the DEIS and BA/BE do not assess the potential impacts from this project in conjunction with ongoing logging operations on the Hoopa Valley Indian Reservation. There is no evidence in the administrative record that either the Forest Service or NMFS adequately considered these activities. In addition, the Biological Opinion and Conference Opinion for the Six Rivers LRMP does not address the cumulative impacts of Forest Service activities in conjunction with Hoopa activities. This deficiency in both the LRMP BO as well as the DEIS and project administrative record renders the assessment of potential impacts to listed fish species unsupportable, and in violation of both the Northwest Forest Plan and federal Endangered Species Act. Finally, the failure to address all similar and connected actions associated with the project, as outlined in the Megram Recovery Strategy and fire suppression, renders the assessment meaningless and inadequate. Thus, both the DEIS and Letter of concurrence from NMFS (dated April 6, 2001) are error in their determination that the proposed actions will "not likely adversely affect" coho salmon or result in the destruction or adverse modification of designated coho critical habitat.

VII. WILDLIFE

1. The DEIS fails to adequately assess potential impacts to Proposed, Endangered, Threatened, and Sensitive (PETS) and Management Indicator Species (MIS) wildlife species.

Proposed, Endangered, Threatened, and Sensitive (PETS) species are protected under the Endangered Species Act (ESA), the National Forest Management Act (NFMA), and the NFMA Regulations to ensure their continued survival. As such the Forest Service must prepare a vigorous survey of burned areas for any PETS plants or animals that may be present in the project area. In order for the Forest Service to ensure the viability of any PETS species, 36 CFR 219.19 requires the Forest Service to have knowledge about the minimum number of reproductive individuals and their populations. As such, the forest service would need to do surveys of the overall population numbers throughout their range and in the project areas to gauge the project's effects on the viability of each species. The DEIS and administrative record do not include such documentation, and instead relies on assumed suitable habitat for these species.

The DEIS acknowledges that the proposed actions will impact the peregrine falcon, American marten, and Pacific fisher, Townsend's big-eared bat, northern goshawk, and southern torrent salamander, all PETS and MIS species (DEIS at IV-28). We conclude that the northern spotted owl and pileated woodpecker will also be adversely affected by the proposed actions. Pileated woodpeckers, martens, and fishers will be especially susceptible to the adverse effects of the proposed actions - specifically the logging of thousands of large snags - thus making proper analysis of their population trends and habitat needs critical. However, the DEIS claims that "pileated woodpecker needs have been addressed in previous issues associated with the retention of snags and down logs in treatment units." However, as explained in other parts of these comments, the snag retention guidelines are insufficient to meet the requirements of the woodpecker as well as numerous other species. The DEIS acknowledges that the proposed project "may impact individuals" of Pacific fisher and American marten (DEIS at IV-28), but only assesses the potential impacts to these species from noise generating activities during the

nesting season. The DEIS acknowledges that 1,391 acres of suitable fisher habitat would be disturbed (DEIS at IV-30), and that 614 acres of suitable fisher habitat would be disturbed (DEIS at IV-31), by the proposed actions. However, these two species are known to utilize large dead snags for nesting, and rely on large down logs for sub-nivean travel during the winter. Impacts to these species from the removal of these critical habitat elements are not assessed in the DEIS or other parts of the administrative record.

As the name reveals, MIS species are indicators of overall ecosystem health, however imprecise their indication may be. Case law such as *Sierra Club v. Martin* (168 F.3d 1 (11th Cir. 1999)) demonstrates that actual estimates of population and population trend on MIS are necessary to accurately gauge the environmental effects of a proposed action, in contrast to the habitat quantifying that is. The DEIS admits that project specific surveys were not conducted for northern Goshawk (DEIS at IV-30), American marten (DEIS at IV-30), and Pacific fisher (DEIS at IV-31). The DEIS and administrative record do not provide evidence that population monitoring data has been acquired for the pileated woodpecker, northern goshawk, or peregrine falcon.

NFMA's fish and wildlife regulations create a substantive duty to maintain viable wildlife populations (36 CFR § 219.19). In carrying out this mandate, the Forest Service is also required to designate and monitor management indicator species in order to "estimate the effects of each [action] alternative on fish and wildlife populations." (36 CFR § 219.19). This duty cannot be carried out merely by conducting habitat monitoring, but requires the collection of population data (*Sierra Club v. Martin* 168 F.3d 1 (11th Cir. 1999)).

In preparing the DEIS, the SRNF did not obtain, and therefore did not adequately consider, population inventory and population trend data for PETS and MIS species as required by the Forest Service's own regulations. The SRNF has failed to conduct the necessary population monitoring and instead relied on habitat information for the evaluation of impacts. This does not provide the population information necessary to evaluate the status and impacts of the proposed actions on these species. Without such data, the DEIS' analysis of the affected area is inadequate. The failure to properly analyze the impacts to PETS and MIS species on the SRNF in conjunction with the proposed action is a clear violation of NFMA and its implementing regulations.

2. The DEIS fails to adequately address potential impacts to Survey and Manage species (plants, salamanders and mollusks).

The DEIS claims that "The proposed activities would not occur in habitat considered currently suitable for any survey and manage species. Based upon loss of tree canopy and the consumption of litter and duff layer in high intensity burn areas, there is a consequent alteration or loss in suitable substrate, plant host associates and micro-climate conditions necessary for the survival and persistence of S&M species. In light of these changes within high intensity burn areas, such areas are no longer considered suitable habitat for S&M species." (DEIS at III-20). This claim can be made because the burn severity mapping conducted by the SRNF averages out burn severity for large areas, and fails to discriminate between severely burned areas and patches of green trees within and between those areas. Thus, for example, an area with 50% of its area burned at 100%

mortality and the other 50% of its area only 10% mortality would still average out to be 60% mortality, and meet the high severity criteria used in the DEIS. Field inspection, as well as burn severity mapping conducted by Humboldt State University using high resolution (6m) color-infrared imagery indicates that substantial amounts of green trees and unburned patches remain within the proposed units. Even the ID Team meeting notes (10-10-2000) acknowledge the presence of these green portions within the units and cite several cases where suitable S&M habitat does indeed exist (primarily rocky substrate that can be used by DNS and mollusks). While we do not dispute that portions of the units that question the determination that no portions of the units are suitable S&M habitat. While areas that are indeed severely burned may not contain suitable habitat for S&M species, unburned patches within the units certainly may provide suitable conditions, and may serve either as critical refugia that provide source populations for recolonization of other areas as they recover or as areas that will recover more quickly and serve as future suitable habitat. The DEIS does not adequately address this issue, and the FEIS needs to provide more site-specific assessment of the potential presence and utilization of unburned patches within the proposed units by S&M species.

3. *The DEIS fails to ensure that LRMP and LSRA snag and log retention guidelines will be met.*

Large snags are key to the survival of many wildlife species (Balda 1975, Thomas et al. 1979). Over 85 species of North American birds and 49 species of animals use snags (Davis 1983, Scott et al. 1977). Unfortunately, large snags have been perceived as a fire and safety hazard and, as a result, have been systematically removed from the landscape.

The proposed snag retention guidelines in the DEIS are grossly inadequate, and fail to ensure that LRMP and LSRA retention guidelines will be met. According to the DEIS, only 3.0 snags per acre > 20" d.b.h. will be left within the white fir series, 2.0 snags per acre within the Douglas-fir/tanoak series, and 0.5 snags per acres within proposed fuel breaks. The DEIS acknowledges that "Only 11 units would meet the LRMP desired level of average snags per acre on a unit-by unit basis after treatment. Only 19 units would meet the desired LSRA minimum average snags per acre on a unit-by-unit basis after treatment" (DEIS at IV-27).

The DEIS goes on to justify this snag-deficiency by stating that "by managing for snags across the landscape (i.e. 100-acre area for each unit), there would be fewer snag-deficient units. All units would meet the average snags per acre described in the LRMP and the minimum average snags per acre described in the LSRA when analyzed at the 100-acre landscape scale." (DEIS at IV-27). This is not consistent with management direction provided in the LRMP: "Snags and logs will be retained at 80-100 percent of the average numbers found on mature and old-growth stands within the Forest. ...Where vegetation treatments occur (including timber harvest and prescribed burning) the actual number of snags and logs per acre will vary depending on wildlife habitat needs, fire hazard, or human safety. However, over any 40-acre contiguous area, the 80 to 100 percent objective shall be met." (SRNF LRMP at IV-78). The DEIS fails to analyze the average snags on a 40-acre basis, and thus fails to demonstrate that the proposed actions will meet LRMP and LSRA standards and guidelines. The DEIS also fails to provide site-specific information regarding the down logs to be retained within each unit, particularly

large down logs. In addition, the DEIS fails to analyze potential recruitment of large snags and down logs within the project area, and how future snag and LWD S&Gs will be met. These deficiencies need to be addressed in the FEIS.

4. The DEIS fails to adequately analyze the role of large woody material in burned areas and potential impacts from its' removal on soils, wildlife, and ecosystem function.

Trees killed by wildfire and left standing can provide significant shade, which can slow the heating of surface waters and the soil surface (Amaranthus and others 1989) and thus modify surface microenvironmental conditions. These trees also may represent an important source for recruitment of large woody debris into streams. Consider the following:

"Dead wood has the potential to influence system recovery in several ways. Standing dead snags mitigate environmental extremes within disturbed areas by shading and preventing excessive heat loss at night. Down logs within forests are centers of biological activity, including not only organisms of decay but also roots, mycorrhizal hyphae, nitrogen-fixing bacteria, amphibians, and small mammals... After disturbance, down logs reduce erosion by acting as physical barriers to soil movement (Franklin et al. 1985) and provide cover for small mammals that disseminate mycorrhizal spores from intact forests into the disturbed area (Maser et al 1978). The sponge-like water-holding capacity of old-decaying logs also helps seedlings that are rooted in them to survive drought (Harvey et al. 1987)." (Perry 1994).

Millions of conifer seedlings are currently regenerating within high severity burn areas. The shade provided by these standing dead trees is critical for their survival. Logging in these stands would kill most of these seedlings and delay and inhibit stand recovery. The FEIS must analyze and disclose the effects of removing these trees on soils, wildlife, and ecosystem function.

The loss of large fire hardened snags is an irreversible and irretrievable commitment of resources that are essential components of the forest's immune system. These snags are essential to large cavity excavators and the cavity nesters that depend on them. These birds eat a significant portion of endemic populations of spruce budworms and other defoliators. They are responsible for maintaining insect defoliators at endemic levels. Large fire hardened snags may persist on the landscape for as long as 80 years.

In a 1955 paper in the Journal of Forestry, F.P. Keen took pains to note that VERY large snags often last much longer than smaller snags, and he suggested that the reason was because VERY large snags have much more heartwood than smaller snags. Heartwood, being more dense than the softer sapwood that predominates in smaller trees, resists decay significantly longer. Therefore, VERY large trees make snags that, on average, last considerably longer--not just a few extra years--and for this reason are of disproportionately greater value to wildlife (Keen 1955).

The added longevity of VERY large snags in a burn zone may even be enhanced due to an effect observed by another BLM researcher, W.G Dahms, in 1949. Dahms noted that fire-killed pine snags in eastern Oregon remained standing roughly twice as long as trees

killed by beetles. Accordingly, if a 22 DBH inch beetle-killed pine produces a snag that stands for 20 years, a fire-killed tree of the same size would last roughly 40 years. And, if a 38 inch DBH beetle-killed pine produces a snag that lasts for 40 years, a fire-killed pine of the same size would stand for a whopping 80 years (Dahms 1949).

This doubling of snag longevity caused by fire hardening indicates that the Forest Service must consider the retention of all large snags in these burn areas. In severe burn areas where regeneration is expected to take many decades, and where opportunities for future snag replacement are very limited, it would be hard to overestimate the importance of leaving all of the larger fire hardened snags.

This agency should be managing burn zones, especially hot burns, to provide habitat for cavity nesters so these birds can persist over time. If these species are extirpated these areas will be set up for future "forest health" problems. As keystone cavity nesting species drop out of the ecosystem, biodiversity will rapidly fall off, as a cascade of biological effects ripples through the system. This loss of biodiversity will persist for many years, until nature can produce trees large enough for suitable new habitat. When these large snags fall they provide large down woody material which is beneficial to future site productivity in other ways than the nutrient cycling and water storage mentioned above. Large down woody material also supports ants and other insect predators which will prevent defoliating insects from getting to epidemic levels. The DEIS fails to address all of the critical roles that large woody material provides, how size and species affect the function of woody material in the ecosystem, and how the potential impacts from removing large diameter material on the ecosystem. This critical analysis needs to be included in the FEIS.

5. The DEIS fails to analyze the impacts of removal of retained snags within fuelbreaks during subsequent fuelbreak construction and fire suppression activities.

One of the primary goals of the proposed actions is to develop fuelbreaks for future fire suppression activities. As the DEIS states: "Live trees would be retained, as well as sufficient numbers of large, dead trees across the project area to meet Forest Plan Standards and Guidelines for snag retention. However, for units within fuelbreaks, lower densities of snags would be left on ridge tops for firefighter safety and to facilitate fire suppression." (DEIS at II-4).

As the DEIS acknowledges, the proposed activities will leave an insufficient number of snags within these areas. Secondly, what snags are left behind have little likelihood of persisting through the next wildfire event. This is even acknowledged by the Regional Ecosystem Office in their review of the Forest-wide LSR Assessment: "It is further understood that these materials would likely be removed during wildfire situations." (REO Review of SRNF LSRA at 5). The DEIS fails to assess the impacts from the total removal of these snags during fire suppression. As the proposed actions are intended to facilitate and create locations for future fire suppression, this is not beyond the scope of the proposed actions. The FEIS must address this critical issue.

The DEIS claims that "The felling and removal of snags for proposed fuel treatment in a small percentage of the landscape is unlikely to be a significant factor for species

dependent on snags." (DEIS at IV-27). However, the analysis fails to consider the potential impacts from all of the proposed snag removal within the project area as outlined in the Megram Recovery Strategy, as well as fire suppression felling. The time it will take to recruit new large-diameter snags will be very long, potentially centuries, assuming that a forest can get reestablished within the logged areas (which is questionable). The impacts from Phase I in combination with Phase II and other future activities within the next 10-20 years will have potentially very significant impacts to these species. The FEIS must address all of the potential cumulative impacts to snag-dependent species from this project and all other foreseeable future actions within the project area.

VIII. ROADLESS AREAS

1. The DEIS fails to adequately assess potential impacts to the Orleans Mtn. "C" Roadless Area.

The DEIS fails to adequately assess impacts to the Orleans Mtn "C" Roadless Area from the proposed actions. The DEIS claims that the Roadless Area Conservation rule allows for the removal of material from substantially altered areas provided there is no additional classified road construction (DEIS at III-26). However, although 61 acres of the roadless area have not been substantially altered (DEIS at III-26), the DEIS does not adequately assess potential impacts to these areas or how the proposal complies with the roadless Rule in these areas. The DEIS asserts that the proposed activities will have minor impacts or will even contribute to roadless area characteristics such as high quality or undisturbed soil, water and air, sources of public drinking water, diversity of plant and animal communities, habitat for PETS species and species dependent upon large, undisturbed areas of land, reference landscapes, recreation, and natural appearing landscapes with high scenic quality (DEIS at IV-37, IV-38). However, the DEIS does not provide any evidence to support these claims. This does not constitute the "hard look" that NEPA requires. The FEIS must provide more detailed and thorough analysis of potential cumulative impacts to the Orleans Mtn "C" Roadless Area from all similar and connected actions, including Phase II and fire suppression activities.

IX. ECONOMICS

1. The DEIS fails to adequately assess all economic costs associated with the project.

The DEIS fails to adequately assess all economic costs associated with the proposed actions, including sale administration and preparation, fuels treatments and prescribed burning, replanting, stand-tending, fuelbreak maintenance, and road construction and decommissioning. The DEIS also fails to discuss or analyze the effects to local workers and compare the estimated number of jobs, both local and otherwise, which are expected to be generated by the proposed actions. Until such time as all costs and benefits of the proposed actions have been analyzed, the economic analysis is inadequate.

X. LATE SUCCESSIONAL RESERVES

1. *The DEIS does not demonstrate that the project will meet all LSR Guidelines for Salvage.*

54 units proposed in the DEIS are less than 10 acres. The proposal to log within these units does not comply with LSR Guideline # 1 of the Northwest Forest Plan, which states that "Salvage in disturbed sites of less than 10 acres is no appropriate because small forest openings are an important component of old-growth forests." (ROD at C-14). The FEIS must address this apparent conflict with the Northwest Forest Plan.

XI. ENDANGERED SPECIES ACT

The stated purpose of the ESA is "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved [and] to provide a program for the conservation of such" species. 16 U.S.C. § 1531(b). Conservation is in turn defined as "the use of all methods and procedures which are necessary to bring any endangered species to the point at which the measures provided pursuant to this chapter are no longer necessary." 16 U.S.C. § 1532 (3). In other words, the Forest Service must do more than simply ensure that its actions are not likely to jeopardize the existence of threatened and endangered species. The ESA requires your agency to use all methods necessary to recover those species. The proposed actions do not meet this mandate, and in fact, threaten the further existence of listed fish and wildlife species, and threaten to cause other proposed and sensitive to become listed in the future. The FEIS must consider alternatives that acts to conserve these species rather than risk their future survival.

XII. NATIONAL ENVIRONMENTAL POLICY ACT

1. *The DEIS fails to analyze all similar and connected actions.*

According to NEPA, to determine the scope of environmental impact statements, agencies must consider:

- 1) Connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they "are interdependent parts of a larger action and depend on the larger action for their justification." (40 CFR § 1508.25)
- 2) Similar actions, which when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. An agency may wish to analyze these actions in the same impact statement. It should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement. (40 CFR § 1508.25)

The DEIS states that "The intent of the proposal is to develop areas that allow for safe suppression activities while restoring natural ecological systems in the long-term, and to minimize uncharacteristically intense fires." (DEIS at B-11). It is clear that fuelbreak construction to be considered in Phase II and future phases, as well as fire suppression activities themselves, are similar and connected actions. In the absence of a

comprehensive EIS analyzing the effects of the entire Megram Recovery Strategy and fuel break proposals, the Forest Service will never analyze, or present to the public, the ecosystem level effects of this extremely ambitious undertaking. Such piecemeal analysis not only flies in the face of NEPA, it renders honest and accurate analysis of the possible environmental effects of the SRNF's vision impossible. It is imperative that SRNF prepare a comprehensive, programmatic EIS before moving forward with the proposed project.

2. *The DEIS fails to consider a reasonable range of alternatives.*

The DEIS fails to consider several alternatives which could meet the stated purpose and need for the project. The failure to consider a reasonable range of alternatives, including working in areas closer to communities and implementing a non-commercial alternative, violates NEPA.

3. *The following NEPA violations also apply:*

- The DEIS fails to disclose controversy & uncertainty.
- The DEIS fails to adequately respond to substantive public comments.
- The DEIS fails to provide for scientific integrity and accuracy.
- The DEIS fails to provide adequate site-specific information and analysis of potential impacts.
- The DEIS fails to adequately describe and assess all mitigation measures.
- The DEIS fails to provide adequate opportunity for the public to evaluate the proposed actions.
- The DEIS fails to identify all irreversible commitments of resources.

XII. CONCLUSIONS

In summary, we do not believe the DEIS is adequate, and urge the SRNF to consider alternative proposals to address real community protection and watershed restoration needs. We look forward to seeing the issues we have raised addressed in the FEIS.

Sincerely,

Anthony Ambrose