Response to Comments
Angora Hazard Tree Removal Project

In response to the legal notice for the 30 day comment period, comments were received from the Tahoe Area Sierra Club and Sierra Forest Legacy (combined), Chad Hanson of the John Muir Project, Jim Hildinger of Angora Lakes Resort, Carla and Dave Ennis, and Lahontan Regional Water Quality Control Board. The comments and the Forest Service responses follow:

A. Tahoe Area Sierra Club & Sierra Forest Legacy

1. We are also very concerned with the type, size and extent of trees that will be cut. The vagueness in the guidelines, which do not distinguish between true hazard trees and trees that will heal but possess some natural variations the USFS is calling "defects", as well as recent observations of the USFS cutting trees that do not appear to be warranted per the USFS' own guidelines, creates a serious concern within the community that these guidelines may not be followed.

   Forest Service Response: ***The hazard tree definition and marking guidelines are shown in the environmental document under the proposed action and Appendix A. respectively. Hazard trees can contain dead, dying, or deteriorating live trees that because of a wildfire or other disturbance factor pose a threat to human life or property. The accurate prediction of tree mortality in the aftermath of wildfire has been an on-going effort by researchers and foresters for many years. As such, the project has used research from the USDA Forest Service Forest Health Protection, Region 5, 2007, report # R0-07-01 and Cluck and Woodruff (June 2007) to determine project specific marking guidelines for what constitutes a hazard tree. These marking guidelines are followed and checked for consistency by trained Forest Service employees in the project area prior to hazard tree removal or mitigation by felling and leaving.***

2. A careful reading of the Pre-decisional environmental document, plus a review of our August scoping comments reveals a series of failures to disclose the likelihood of significant environmental impacts, a failure to respond to requests for more details requested in the scoping comments, and a failure to provide adequate information for informed decision-making.

   Forest Service Response: The project area encompasses approximately 256 acres of Forest Service System (FSS) roads and trails within the 3,100 acre Angora Fire. Within the project area, about 167 acres are proposed for a combination of mechanical removal and hand felling of dead or dying trees, while 89 acres are proposed for a combination of hand felling or monitoring tree mortality only (see pages 6-7). According to Landsat imagery of vegetation severity after the Angora Fire, 166 acres or 65% of the project area is classified as having greater than 75% basal area mortality, 42 acres having 25-75% basal area mortality, 34 acres having 0-25% basal area mortality, and 14 acres having no basal area mortality. The high vegetation severity areas (> 75% basal area mortality) of the project correspond closely to the mechanical removal portion of the project described above. The moderate to low vegetation severity areas (<75% basal area mortality) correspond to the project acreage that would contain hand felling mitigation and delayed tree mortality monitoring.

The project's proposed action and purpose and need are also consistent with Forest Service Handbook (FSH) 1909.15 chapter 31.12 for NEPA analysis using category 11. Category 11 includes Post-fire rehabilitation activities, not to exceed 4,200 acres (such as tree planting, fence replacement, habitat restoration, heritage site restoration, repair of roads and trails, and repair of damage to minor facilities such as campgrounds), to repair or improve lands unlikely to recover to a management approved condition from wildland fire damage, or to repair or replace minor facilities damaged by the fire. The management approved condition for this project is removal and mitigation of hazard trees along the road and trail system and rehabilitation of system roads and trails impacted by project activities.

The Forest Service Interdisciplinary Team (IDT) determined that there were no extraordinary circumstances related to the project that may result in a significant individual or cumulative effect on the quality of the human environment. Therefore, there are no significant environmental impacts with the project and complete project analysis and reports are available in the project record. The analysis found within the reports informs and discloses the effect to the environment for the interested public and provides informed decision-making to the forest supervisor.

3. So how significant is the risk of falling trees in the Angora burn area? In our scoping comments we asked for studies that disclose the risk of falling trees to those recreating on FS roads and trails. To date, none have been provided. We have also searched the Forest Service website and other websites regarding fire mortality statistics in both the US and Canada. There are simply no recorded deaths or injuries that we could find for the past 10 years due to a non-firefighter being injured or killed by falling trees in burned areas.

Forest Service Response: The longevity of snags is determined by many factors such as the size of the tree, species, cause of mortality, soils, climate, the occurrence of wildland or prescribed fire, and the occurrence of severe weather events such as heavy snows and high winds. According to Cluck and Smith (2007), Fall Rates of Snags: A Summary of the literature for California conifer species (NE-SPR-07-01), fire killed snags and therefore hazard trees in burned areas may begin to fall within the first year of the fire with greater than ½ of the trees falling in the first 10 years as shown in several studies. While studies are lacking regarding the risk to falling trees on recreationists that does not mean that the risk within a burned area along a road and trail segment does not exist or is equal to the risk in an unburned area. There are fire killed and weakened trees along all segments for all travel corridors the project area. In the project purpose and need section on the first page of the pre-decisional memo it states the following:

> ***"****It is estimated that the road and trail system within and adjacent to the fire perimeter has experienced approximately 1000 visitors per day during peak use prior to the fire (Villanueava personal communication, 2007). In addition to the road and trail system being used by the public for foot traffic, system roads within the fire perimeter are also used for special use access for Angora Lakes Resort, administrative access, and public utility access (LTBMU Gate Management Plan 2005). Recreation, research, and post-fire rehabilitation, are expected activities within the fire area. These activities will involve a large number of people functioning around hazard trees unless the hazards are mitigated."*

It is also expected that due to the close proximity to neighborhoods and the urban environment, the road and trail system within the fire area (project) will continue to experience high use from all recreation throughout every season of the year.

Also, while studies are lacking regarding the risk to falling trees on recreationists, this does not mean that people have not been killed within burned areas. An example of a fatality within a burned area occurred on the Inyo National Forest (in California) in 2003. A Forest Service employee, trail crew leader was killed when stuck at her camping area by a hazard tree post fire within a fire burned area .

4. Is there some risk of someone being hurt or killed by a falling tree in the burn area? There's always that chance. Is that risk any greater than the risk of being injured or killed in the rest of the forest? No. Especially if (as we have advocated in our scoping comments) the trees that are obviously leaning toward the trails and system roads, or ones that appear to be significantly weakened due to such events as burned roots, are removed as hazards.

   The rest of the trees should not be removed. Put another way, if only the truly hazardous trees are removed, the risk to the public is minimal and acceptable. On the other hand, removing all the trees being proposed for removal in this project **will result in a substantial and unacceptable risk to soils, and especially to SEZ soils.**

   Forest Service Response: Refer to response for comment A3 and E1. The lean of a tree normally indicates which direction it will fall. Trees with burned roots will typically fail sooner than other burned or killed trees because there is damage to the support structure of the tree. Tree lean and root damage are both criteria in the Hazard Tree Marking Guidelines found in Appendix A. of the pre-decisional memo. Depending on factors such as wind direction, fire severity, tree height, tree species, broken limbs, and proximity to other weakened trees, the project boundary for hazard tree removal was determined to be 150 feet on either side of the road or trail. This accounts for the effect of one tree falling into another tree creating a "domino" of hazards and airborne tree tops or branches near the road or trail. Therefore, the potential for a tree to have a target such as a human within this boundary is greater than it is outside of this area.

   The forest service hydrologist along with input from the forest service soils scientist and Tahoe Regional Planning Agency soils scientist determined project design features for implementation of the project. These project design features along with several field visits to stream environment zones are documented in the pre-decisional memo and in the soils and hydrology report respectively found in the project record. The statement below is found in the predecisional memo on pages 8 and 9.

   > ***"****The Forest Service hydrologist, in consultation with Forest Service soil scientist and Tahoe Regional Planning Agency (TRPA) soil scientist conducted field assessments to determine site specific project BMPs and design features as seen below. In addition, a cumulative watershed effects analysis (CWE) was completed as part of the soil and hydrology report (see project record exhibit B5) to determine the impacts from the proposed project on water resources. The proposed treatments, with the proper implementation of design features and applicable BMP's as described in the proposal (See appendix B), are expected to result in little to no increase in erosion or negative impacts to soil and water resources in the area.."*

Your statement "On the other hand, removing all the trees being proposed for removal in this project will result in a substantial and unacceptable risk to soils, and especially to SEZ soils," is not supported by any evidence.

5. We have also surveyed other Forest Service regions to learn their rules on hazard trees along system roads and trails. To date, those we have talked to in Colorado have said they do not clear hazard trees along trails or administratively limit access roads, as the Angora Project proposes. They do close the trails in the event of a strong windstorm or when the ground is wet. If the ground is very wet, they will also close the trails for the duration of time that the ground is very wet.

   Forest Service Response: Hazard trees exist throughout all National Forest System Lands. Due to varying amounts of human presence in all areas, hazard trees are managed differently for all geographic regions. Several forests in California have included commercial removal of fire killed hazard trees with salvage as part of their project purpose and need. Examples include but are not limited to the Freds Fire Restoration and the Power Fire Restoration projects.

6. As we noted in our scoping comments and reiterated above, trees that are obviously leaning toward the trails and system roads, or ones that appear to be significantly weakened due to such events as burned roots, should be removed as hazards. But to remove old growth trees that have survived numerous fires before the white man arrived in the basin we judge to be a poor policy, not respectful of the forest or the soils or the taxpayer's money. In short, it is a policy that does not achieve forest health, does not protect soils, and will not be any better at making people safe than if only true hazards were removed.

   Forest Service Response: Refer to response to comment A4. The project purpose and need states "…there is a need to remove standing hazard trees that pose risk to life and property…." The project defines hazard trees and discloses the marking criteria in Appendix A. Marking Guidelines. The criteria for hazard tree removal does not include removing healthy trees with old growth characteristics.

7. Sometimes projects are undertaken for economic reasons, though this criterium rarely applies in the Tahoe Basin where hundreds of millions of dollars are being spent to remedy past forest and development activities. It would be absurd to justify projects on the basis that they might generate a few thousand dollars in revenue while impeding/counteracting the millions of dollars being spent on restoration. One must ask, why is the Forest Service pursuing a project that not only is <u>not</u> required by Congress for the Lake Tahoe Basin, will <u>not</u> protect safety in any meaningful sense, will damage soil, SEZ, and old growth resources and will not raise funds for the federal treasury? One could not describe a more pointless, expensive, and wasteful use of the taxpayer's money than that.

   Forest Service Response: The project purpose and need is not driven by maximizing the economic value of trees. Hazard trees removed through the project could offset removal costs. See response to comment A6. The Lake Tahoe Basin Land and Resource Management Plan (1988) as amended by the Sierra Nevada Forest Plan Amendment (2004) provides framework and guidelines for salvaging fire killed or damaged trees.

8. Finally, if one assumes that there is some level of threat, then alternative options for addressing this threat must be discussed. We reiterate our previous statements from August, asking the USFS to document any other options you have considered. The 2 ends of the

spectrum of possibilities seem to be 1) cutting down all the trees that might even remotely pose a risk even years to decades down the line versus; and 2) closing the roads/trails where there is a documented risk, followed by clearly marking those closures until conditions change. We believe you can steer a middle course between these extremes and that a solution can be found in which trees are cut very conservatively while the public is still protected from any "above average" or "abnormal" risk.

Forest Service Response: As described in the project pre-decisional memo on page 5, there are unit specific actions that include a balance of activities from hand felling and leaving hazard trees on site, mechanical removal of hazard trees, monitoring areas for increase in post-fire mortality, hand felling trees and leaving greater amounts on the ground within stream environment zones for water quality and habitat considerations, hand felling hazard trees and burning excess fuels, and hand felling hazard trees and using endlining for removal in sensitive areas. All of these activities meet the project purpose and need. The project area possesses a need for administrative use and a high demand for recreation use of system road and trails. Closure of system roads and trails is outside the scope of this project. No significant issues or extraordinary circumstances exist regarding the proposed action so consideration of alternatives are not required by NEPA. Alternatives are not analyzed under NEPA analysis with categorical exclusions.

9. The following paragraph is taken directly from our August scoping comments. This information has not been provided in the CE.
"Due to the sensitive nature of LTBMU work in this area, it will very important to disclose the… specific trails and narrow roads that will be widened to 15 feet, and
the places on the roads and trails that will require even greater widths than 15 feet."
We note that the document provides maps, but no indication of which system roads and trails will be widened to 15 feet and which system roads and trails will be widened to greater than 15 feet.
If all roads and trails are to be widened to 15 or more feet, that information should be made public. This is an area of great interest to the community, and especially to the homeowners in the Angora fire area. Sensitivities are very high, and the USFS is under greater scrutiny because of that.

Forest Service Response: The project includes rehabilitation of trails as a design feature for meeting recreation objectives as well as hydrology, scenic and wildlife objectives. There will be no widening of roads or trails as an end result of the project. Equipment may utilize skidding and forwarding of trees on and near roads and already compacted and disturbed trails for operations to transport trees to the landing for processing. The following are design features that describe rehabilitation of roads and trails. These are taken from page 7 and 9 of the pre-decisional memo for recreation and hydrology resources respectively.

<u>Recreation</u>

1. *Leave, on the ground, felled logs and woody debris irregularly placed adjacent to system roads and trails to discourage creation of user-defined trail use. Quantity of downed logs should be consistent with fuel loading objectives averaging 10 tons/acre across the unit.*

2. *Following management activities, utilize felled logs of 12" minimum diameter across system trails, and notch out to a 60" trail width. The number of felled logs to be treated this way should average one per 250 linear feet of trail (approximately 1 every 1.5 acres of project area along roads/trails). This is especially important near trail entry points to discourage off highway vehicle use.*
3. *Following removal operations, install drainage dips on system trails approximately every 150 linear feet. Locate drainage dips to prevent discharge of sediment to surface waters where feasible.*
4. *Following removal operations, decompact trail widths, with the exception of a 24" wide tread located along the original trail alignment.*

Hydrology

9. *Where system roads or trails are used for forwarding/skidding, they would be returned to the standard Forest Service road or trail width (10 ft and 5 ft clear width, respectively) after operations are completed in the area. The methods for narrowing may include subsoiling to the desired width and/or installing physical barriers along the desired width to prevent user created access off the road or trail.*
10. *One existing non-system road would be decommissioned after operations are complete (number 11 on the SEZ/stream crossing map).*

We have addressed this concern on more than one occasion. Your comment regarding which roads and trails are to be widened to 15 feet has been addressed as not occurring. On August 8, 2007 in a phone conversation with Laurel Ames (a Sierra Club member involved with submitting comments during scoping) (see project record), it was mentioned to Laurel that equipment may use the trails for skidding and forwarding but the trails would be rehabilitated to their original width and location. A second occasion for this comment being addressed was on the 11/30/07 meeting between the Forest Service and your group. The excerpt meeting notes are shown below (see project record)

Carla: Has not looked at the map for this project. In general would be good to put road names and known landmarks. FS maps generally hard for layperson to read.

She would like to bring up the issue of widening roads to 15 feet.

Duncan: Clarifies that we are not proposing to create new roads. Some trails may be temporarily widened to get equipment down them, but will be rehabbed back to trail prism.

Cheva: We've actually been going the other way during post-fire work and have rehabbed some user-created trails and old roads.

10. The project proposes to utilize the USFS BMPEP program to evaluate the success of the BMPs for this project. This is an option only in those cases in which the FS standards are equal or superior to those of the Lahontan Regional Water Quality Control Board. The project must follow the monitoring requirements included in the Lahontan Water Board's January 2007 Timber Waiver as this project falls under Category 5 as defined in the Waiver.

    Forest Service Response: The project will follow permitting requirements as required by Lahontan Regional Water Quality Control Board. This is shown on page 15 of the pre-decisional memo.

11. The list of BMPEPs in Appendix B is little help. The BMPEPs are general, not specifically related to the Tahoe Basin and its nationally recognized fragility, nor to the recent results of the TMDL identifying fine sediments as the chief culprit in the loss of clarity. There is no BMPEP on the proposed list that addresses the amount of sediment that is expected to be mobilized from the site, both during and after the project. There is no BMPEP that addresses the increased sedimentation from increased disturbance, although the TMDL has made that issue quite clear. Thus, there is no proposed BMPEP that addresses the increased sedimentation from increased widths of the trails and roads. At any point where specific but unrevealed criteria will be relied upon, those criteria fail to exist in this document. The BMPEPs state "need determined by a watershed specialist", or "as determined by a watershed specialist". Our concern is the criteria the watershed specialist will use: they are not to be found in Appendix B. It is impossible to understand from Appendix B and the individual BMPEPs what the criteria for determining what specific measures would be used, what the rules are that govern how the criteria are implemented, and how failures are to be corrected.
End-lining is a case in point. The document says the furrows that are created on steep slopes will be "hand-raked" as determined by the watershed specialist, but does not describe how hand-raking will succeed in reducing mobilization of the soils raked into the furrow, or, further, how hand raking will divert stormwater and snowmelt from finding the path of least resistance – the furrow – and protect the furrow from becoming a new gully at the same time it is transporting the raked material downhill.
In short, the lack of response to our comments about specific issues is a warning flag to us about the problems that we foresee in the management of the project that you propose. The deficiencies in the water quality measures alone demonstrate the need for a more robust environmental disclosure document.

Forest Service Response: There is a difference between Best Management Practices (BMPs) and the BMP evaluation program (BMPEP). BMPs are practices employed on a project specific basis that are approved by the State of California and the EPA designed to meet water quality standards and comply water quality protection requirements of Sections 208 and 319 of the Federal Clean Water Act and the US EPA. They are also within the guidelines of the Water Quality Control Board (Basin Plans) developed by the nine RWQCBs in California. The BMPs were selected on a project specific level and they take into consideration the type of activities occurring in the project. The list of BMPs used to address water quality along with project activities is found in Appendix B of the pre-decisional memo. The BMPEP is a program designed to monitor the implementation of BMPs on a random set of projects. A description of this program is found on page 15 and Appendix C of the pre-decisional memo. In addition a detailed description of BMPs and the BMPEP are found in the Forest Service, Pacific Southwest Region (Region 5) Water Quality Management Plan, entitled Water Quality Management for National Forest System Lands in California (2000). This plan, which is part of the State Of California's Non-point Source Management Plan, outlines Forest Service Best Management Practices (BMPs) that have been certified by the State Water Quality Control Board and approved by the United States Environmental Protection Agency. The Plan also describes the evaluation of BMPs through the BMPEP.

Raking in depressions and ruts that result from project activities such as endlining are identified as a project design feature to address water quality in the pre-decisional memo. Hand raking is a practice that has been used to limit erosion potential and is

proven successful. The criteria for hand raking are clearly identified in the predecisional memo, pages 8 and 9, (#8a iii., #13a) and are shown below.

8. Ground based equipment would be restricted within SEZs to existing system trails and roads. SEZs would instead be treated with hand crews, leaving the resulting logs in place.

- *a. If fuel loading in a given SEZ warrants removal of the felled material, trees would be directionally felled and end-lined out of the SEZ after consultation with a Watershed Specialist to determine appropriate trees and locations for end-lining.*
  - *i. To the extent practicable, end-lining should occur at approximately a 45º angle from the stream channel until material is outside of the SEZ boundary.*
  - *ii. End-lining of material would not take place within 25 ft of the stream channel unless direct contact between the tree and the ground could be avoided.*
  - *iii. Where there is potential for sediment delivery, the berms from ruts created with end-lining would be hand raked to fill in the resulting depression, and ground cover would be distributed over these areas, such as slash, wood chip, or masticated material.*

13. Where ruts are created during forwarding/skidding operations and the Watershed Specialist identifies the need, the berms of the ruts would be hand raked to fill in the resulting depression, and ground cover would be distributed over these areas, such as slash, wood chip, or masticated material.

- *a. The need for hand raking of berms would be determined based on the length and depth of ruts, the proximity to SEZs, and the angle of the rut in relation to the hillslope angle.*

12. Our Scoping Comments requested a comparison between the soil disturbance and SEZ disturbance that will occur between commercially logging this area and using a much lighter, ecosystem approach, of leaving logs on the ground, using small equipment rather than commercial logging sized equipment, and of removing material in a much more benign way – chippers vs. haulers, hand thinning, and more. We are concerned about the impacts of 15 foot wide roads to accommodate large equipment.

Forest Service Response: A description of the impacts of this project to soils and SEZs is found in the Soil and Hydrology Specialist Report 10/24/07 (project record). See response to commentA 9.

13. As we read in this document, the 16 SEZ areas in Unit 5 are now to be covered with metal mats to reduce impacts of the heavy rubber-tired logging trucks. There is no BMPEP for placing and removing metal mats in a benign manner. There is no BMPEP that describes how the transport of metal mats across the intervening areas, which are sloped in many places, will be accomplished. There is not only no description of how the metal mats will be transported across the intervening areas, there is no description of the damage that could be expected from heavily loaded equipment and no description of the specific BMPEP that will be employed to prevent that damage.
Unit 5 cries out for a much lighter touch, such as leaving trees on the ground, using light-weight over-the snow vehicles, and hand-thinning, for example.
By locking the Lake Tahoe Basin Management Unit into a commercial log, which, in the end, will only net $34,065 at the end of a period of time of significant disturbance of the ground and the forest, the alternative and opportunity of protecting the area, protecting

the large trees that are not truly hazard trees, protecting the soils, protecting the water quality and the clarity of the lake is lost. For $34,065. The project as proposed does not pencil out either economically or environmentally.

Forest Service Response: Only 4 of the 16 SEZ areas are to be covered with metal landing mats.. According to the pre-decisional memo, on pages 12 and 13 it is clear that the features shown in Appendix D map 4 requiring metal landing mats are #1, 3, 5, and 9. As described in the pre-decisional memo, these are areas that are seasonally moist areas, which will require the use of metal landing mats for crossing with equipment on short stretches of the project area if they are not dry. Metal landing mats have been used in the Lake Tahoe Basin and have proved successful at preventing damage to soils. Past projects that have used metal landing mats are the Pioneer Hazard Reduction Project EA (1996), and the Pope Marsh Fuelwood sale during the 1990s. The use of landing mats in these projects was accepted by Lahontan Water Quality Control Board.

As described in the project purpose and need, the Forest Service has identified that removal of hazard trees is a priority for public safety along the heavily visited travel network. The sale of hazard trees as timber is a tool used to offset costs for removal.

14. As stated in our previous comments in August, the document must disclose the volume of board feet that will be removed from the SEZs by size (over 16" dbh and 16" dbh and under). The document must also disclose the volume of board feet that will be removed that exceeds 30" in diameter in all areas and for all tree species. Table 1 on page 15 must be expanded to reveal the number of trees to be removed between 16" dbh and 30" dbh and greater than 30" dbh. The experience to date with hazard tree removal is a documented history of examples of large trees removed under the guise of being a "hazard". .Several have been identified by foresters and residents as falling in the category of not-burned or slightly burned, or more than half of the tree sporting green needles. We have no reason given in this document not to expect the same serious errors in this project. The Guidelines that were used called for such trees to be left in place, yet many were not. In other words, we have no reason to assume these guidelines will be followed since guidelines have not been followed in other recent activities.
This project needs to have a much clearer public understanding of what you are doing and why. Both the final document and the USFS public presentations must disclose to the public what will happen to the public's trees. Which will be spared, which saved?

Forest Service Response: If a tree is considered a hazard through use of marking guidelines, the diameter of a tree is irrelevant if it possesses a threat to human life or property. The pre-decisional memo discloses the estimated volume in cubic feet of hazard trees by species that will be removed. It is possible to convert tree volumes from cubic feet to board feet. A project specific conversion is given on page 2 of the pre-decisional memo under the proposed action. According to estimates, approximately 30% of trees removed in the project are between 16-30" in diameter. Approximately 2.5% to be removed are 30"an greater in diameter. To put it in another perspective in the 256 acre project area, a total of approximately 76 trees/acre removed as hazards with 23 trees/acre between 16-30" and 1.5 trees/acre greater than 30."
Refer to project proposed action and marking guidelines for which trees would be removed and which trees would remain on site standing or on the ground.

15. In terms of the Tree Removal Guidelines identified for this project (in Appendix A titled "*Angora Fire Forest Service System Road and Trail – Hazard Tree Marking Guidelines*"), many questions remain as do many concerns based on activities already completed or in progress.
1. The first sentence explains that "Hazard trees are any dead, dying or living tree, that because of significant fire damage, insect attack, disease, or mechanical damage poses or will pose a hazard to people, structures or other personal property if they are to fall."
a. A living tree with such significant fire damage that is poses a threat of falling is likely a threat because it has become a dying tree, therefore it should be categorized as such and living trees (living because they were not significant affected by the fire) should not be cut for any reason.
b. Regarding "if they are to fall" – It is assumed that a hazard tree is likely to fall *because* it is dead or dying (although this does not mean we agree that these trees truly pose such a hazard since, as mentioned in this letter, no evidence has been located or provided that shows trees would pose such a hazard to humans to warrant removal in this capacity). Certainly all living trees would be a 'hazard' if they fell; but the real concern is whether they will fall, and of course we do not cut living trees down because of the minute potential that some day, some unexpected occurrence will cause the tree to fall, just like we do not close forests because of the chance a hiker might encounter a bear or mountain lion. Only dead and dying trees would have any elevated potential to fall (above the potential in any regular forest). This is yet another reason the reference to "living trees" in the statement above is incorrect.

Forest Service Response: Refer to responses to comments 1, and 3-6. The project marking guidelines take into account the severity of damage to a tree. Only trees categorized as hazards would be cut. See response to A16 below

16. c. The Proposal refers to the *Sierra Nevada Forest Plan Amendment, 2004, Record of Decision, Page 52, #13** as the basis for using economic factors to mark trees for salvage. This item only prescribes salvage logging for "dead and dying" trees – there is no allowance for "living trees." Further, as discussed herein, the USFS has not identified how it will clearly determine dead and dying trees from living trees which were burned on the outside and will recover, as has been the way of our forests for hundreds of years through multiple fire regimes.
* "13. Determine the need for ecosystem restoration projects following large, catastrophic disturbance events (wildfire, drought, insect and disease infestation, windstorm, and other unforeseen events). Objectives for restoration projects may include limiting fuel loads over the long term, restoring habitat, and recovering economic value from dead and dying trees. In accomplishing restoration goals, long-term objectives are balanced with the objective of reducing hazardous fuel loads in the short-term. Salvage harvest of dead and dying trees may be conducted to recover the economic value of this material and to support objectives for reducing hazardous fuels, improving forest health, re-introducing fire, and/or re-establishing forested conditions."
d. Also of note is that where is it questionable that a tree may or may not survive, until and unless it is clear that it will not survive and would therefore be considered "dying," that tree can not be called "dying."

Forest Service Response: As shown in the marking guidelines which are backed by scientific research and contained in the pre-decisional memo, trees are considered hazards if they are damaged by fire or other mechanisms and they are more likely to fail as a result of that damage. The interpretation of "dying" trees is that they are still

living trees weakened by fire, age, drought, or other mechanisms and they are lacking proper nutrient transport to sustain live over more than a few years . In addition, the project purpose and need (page 1) also highlights the fact that the Land and Resource Management Plan (1988) call for salvage of trees as described below:
"The LTBMU Land and Resource Management Plan (1988 LRMP) as amended, prescribes the use of salvage as a practice for removing dead, dying, deteriorating, or highly susceptible trees where fire and other mechanisms have caused damage."

The project specific actions calls for monitoring some units in the project where the damage of trees from the fire is minimal (page 5 and 6 pre-decisional memo). It is stated in the pre-decisional memo that units 1, 3, and 6, have areas where trees are not considered hazards as they exhibit signs of little fire damage and healthy green crowns.

17. We assume "mechanical damage" would occur from the mechanical equipment that is being used to commercially remove actual hazard trees. Given the loss of so many trees already, it is not acceptable that the use of mechanical equipment cause more to be lost. If an area is too small to accommodate mechanical equipment without causing damage to living trees, then mechanical equipment should not be used in that area. The USFS must address alternative means to remove any true hazard trees.

Forest Service Response: Mechanical damage of residual healthy trees occurs in any salvage, harvest, or thinning project. The damage to residual healthy trees in the project area is expected to be minimal due to the fact that many areas where hazard trees are proposed for removal are either completely burned and dead or have openings with healthy living trees as a result of past forest thinning and fuel reduction. Areas that were thinned and where fuels were reduced experienced lower than average fire severity and few trees were significantly damaged or killed, resulting in fewer hazard trees to remove. Furthermore, these thinned areas contain openings that allow equipment operations to take place with even less damage to residual healthy trees because there are more options for equipment travel routes due to larger openings. Strategies used to minimize tree damage are proper layout of skidding/forwarding trails and careful sale administration.

Other Forest Service strategies for dealing with mechanical damage are present in standard contract language. An example of contract language typically carried into a project like this, that discourages incidental damage or removal are shown below:

B6.32 Protection of Residual Trees. *Purchaser's operations shall not unnecessarily damage trees to be reserved*

B3.42 Timber Cut Through Mistake. *Undesignated timber meeting utilization standards, cut by purchaser through mistake and included by contracting officer under B2.14 shall be removed and paid for at current contract rates and required deposits, unless such material is not listed in A2. In such event, contracting officer, in accord with standard Forest Service methods shall establish rates to be paid.*

B3.44 Undesignated Timber Unnecessarily Damaged or Negligently or Willfully Cut. *Undesignated timber meeting utilization standards and unnecessarily damaged or negligently or willfully cut by Purchaser, if included by Contracting officer under B2.132, shall be cut, removed, and paid for at current contract rates and required deposits that are in addition to liquidated damages under B3.46*

18. The next paragraph in the Guidelines states that the "following" guidelines are listed "by species" but there is no mention of or delineation between species in the guidelines.

Forest Service Response: The marking guidelines would apply to all tree species equally.

19. Regarding "all species marked for removal will be a minimum of 10" dbh." Hundreds to perhaps thousands of trees less than 10" dbh were killed in this fire. We assume that a 4, 6, 8, 10" dbh, etc., sized-tree falling on someone could still cause them harm. Because the purpose of this tree removal is to protect lives and property, it is expected that all true hazard trees would be removed. Since the USFS is contending that trees in these areas pose a threat, then it would follow that leaving behind these smaller trees (and only taking the larger trees) leaves behind a potential hazard – thus this guideline is in conflict with the stated purpose of this project. This part of the prescription is clearly indicative of a prescription based on obtaining the most commercial value, since these smaller trees carry little to no commercial value. We do not feel the USFS should neglect potential hazards to lives and property because they do not carry as much or no commercial value. Leaving behind these smaller trees (in addition to those that would remain based on a site-specific prescription that addresses other environmental parameters [e.g. wildlife habitat, soil quality, etc.] as well as hazards) is irresponsible and contrary to the stated purpose of this project.

Forest Service Response: There are hazard trees less than 10" dbh. These trees would not be removed but would be mitigated through cutting or ran over by equipment. These smaller diameter hazard trees would be utilized as chips from chipping, ground cover, and for barriers in trail rehabilitation and sensitive areas. It is important to note that hazard trees less than 10"dbh are shorter in height than trees with larger diameters (tree diameter is positively correlated to tree height). In addition, it is stated in the pre-decisional memo that hazard trees are considered for removal no greater than 150 feet from a road or trail and within 1 ½ times (referring to tree height) the distance of the road or trail. Consequently, the distance away from the road or trail in which 10"dbh trees are considered hazards is less than trees of greater diameter, hence there are few trees considered hazards that are less than 10" dbh.

20. The USFS should document why all marked trees are being marked as hazards (list should include description of trees including dbh, height, etc.). This information should be made available to the public before trees are cut.
In addition, for all trees marked based on being a "hazard" to system roads and trails, the USFS should document the tree's height and distance to the road or trail. The proposed "cut criteria" for distance to the road or trail of 150% of the height of a tree is excessively cautious for most potentially hazardous trees.

Forest Service Response: Comment noted. The distance of 1 ½ times or 150% was selected to account for the domino effect of falling trees and airborne limbs that have potential to strike a human or property. Forest Service marking crews take into account the tree height and distance to road or trail for hazard tree marking. See response to comment A4.

21. Number 1. "There is zero green foliage remaining." We feel this is an acceptable guideline for all tree species as it takes an agreeably conservative approach and the

science tells us that trees survive far better than we would imagine (e.g. trees with no guideline clearly indicates that if there are ANY green needles left on the tree, the tree stays.
a. However, there is concern that the USFS will not follow this guideline in the field because residents, concerned citizens and registered professional foresters have recently observed guidelines not being followed in other "hazard" removal activities. For example, in other areas identified by the USFS as having undergone "hazard tree" removal activities on Urban Lots or near paved roads and homes, we have seen numerous trees that were cut and/or marked as hazards that still boast many green needles – in many cases well more than 50% of the needles are green. Further, tree cutting activities have occurred in some areas that according to these maps are included in this project; therefore, there should be no tree-cutting or even marking in those areas at this time or even more so, over the last two months (which is the time period these activities have been observed).
b. After weeks of inquiry, we received the Guidelines that, according to USFS silviculturists, were used for this earlier round of tree cutting on urban lots and along roadways/adjacent to homes; those guidelines specify percent green foliage by tree species, which is a less conservative approach than what is proposed in this project. Regardless, we saw cut and marked trees that, based on those guidelines, should not have been touched. Therefore, as mentioned, one of our concerns is that the USFS may not follow their guidelines in this project either.

Forest Service Response: Comment noted, hazard tree marking guidelines are different in the Urban lot hazard tree removal that occurred during the summer and fall of 2007. The marking guidelines with this project are intentionally more conservative. Marking guidelines are implemented and followed by trained forest service personnel.

22. Number 2. "All hazard trees exhibiting one or more of the following defects should also be considered a hazard depending on the severity and if in combination with fire damage."
a. The USFS needs to document how the "severity" of the damage is determined. We were told that the USFS did not document the reasons that numerous large trees (well above those sizes protected by TRPA Code or associated with Old Growth areas and therefore rare and notable) with healthy cambiums had been cut in the first hazard tree removal activities (in this case, the stumps are found along Tahoe Mountain Road). The public should be able to, as part of this public review process, assess how these guidelines will be applied, as should other forestry experts be able to use the published guidelines to assess trees and come to similar conclusions as USFS staff based on information provided in the guidelines (in other words, non-USFS forestry experts should have enough information in this document to basically be able to 'repeat' the marking in these areas and obtain very similar outcomes as a USFS staff member) but the information needed for the public and other forestry experts to truly assess these guidelines has not been adequately supplied by the USFS. The guidelines, as written, leave the marking open to extreme interpretation; we understand professional opinions always play a role but the minimal information provided is inadequate.
b. This should read "…considered a potential hazard…" for reasons discussed throughout these comments.

Forest Service Response: Comment noted, see response to comment 1.

23. The USFS needs to clarify (and apply as it relates to marking trees) the difference between "fire damage" that affects a tree's ability to thrive (in other words, damage which causes the tree to die) and damage which only affects the outside bark and for which the tree will recover, as trees have done for hundreds of years through multiple fire regimes. Research shows that trees have adapted to frequent fire in the Basin. Put generally, bark gets burnt but it protects the tree, heals over time and then this is repeated with each fire. Fire damage not affecting a tree's survivability does not justify cutting a tree down (and therefore trees in this condition can not be considered "dead or dying" and therefore not be considered "hazard trees" and salvaged) – consider again the instructions in the 2004 Framework, which only allow salvage of "dead and dying" trees.

Forest Service Response: The Forest Service agrees that trees in the project area, especially larger fire resistant and resilient pine trees, have the ability to survive low and even moderate intensity wildfires. A tree's bark thickness is one variable out of many that can determine a trees survivability during a fire. There are other variables directly related to fire behavior such as fuel loading (amount and arrangement), and fuel moistures (live and dead vegetation and biomass). These variables affect the amount of live tree crown burned as well as the intensity and duration of soil heating which can cause thermal girdling of tree roots. The degree of burning of duff and larger surface fuels determines the depth of lethal heat penetration into the soil causing thermal girdling (Ryan and Noste 1983). Both damage to the tree crown and damage to tree roots also determine a trees ability to survive and should be assessed along with damage to bark. These variables are present in the Appendix A marking guidelines. Refer to responses to comments A1, and A 3-6

24. The document states that "Lean of a tree and factors contributing to the lean…should be carefully inspected and felled if also damaged in the fire." Naturally, if the tree is not leaning towards the road or trail of concern, then it poses no hazard to users of the road or trail. The Guidelines need to make this distinction. Additionally, consideration should be given to the fact that some of the burned trees that still have green needles will have a reduced canopy for years. Wind in a reduced canopy will put less stress on a tree and thus less of a chance for it to break or blow over.

Forest Service Response: Refer to responses to comments A1, and A3-6. Prior to the Angora fire, winds in the project area were considered very high due to the down slope channeling effect of winds during storms (Angora BAER report 2007). With the absence of living trees and live crowns it is expected that winds in the project area have the potential to be even greater.

25. In terms of looking at all of these structural "variations" (while the document refers to them as "defects", many are simply part of the natural variation we see in any forest), there is one main issue to consider. If a tree had one of these "variations" before the fire, and the fire did not damage the tree in a way that would kill it, then simply put: the tree should not be cut. That tree would not have been cut before the fire. If the fire did not affect its ability to live, then there is no justification or reason to cut it after the Fire. For example, many trees around Tahoe are "split" into two trunks. We do not go around and cut trees that exhibit this variation now. Therefore, if the bark is burnt but the cambium remains in tact such that the tree will live, then the tree can not be cut down. *It is as sound as it was before the Fire and it would clearly not have been cut before the Fire*. Further, if it is not clear whether a variation combined with the burn will result in tree

death, then as mentioned, the USFS should leave the tree standing and monitor it over the next three years because science indicates that it has a good chance of surviving.

Another example of our concern with these "variations" relates to "cat faces," which we see quite commonly on Incense Cedars. In fact, one glance at the base of Gardner Mountain (Unit 2a, and the only unit that has Cedars) reveals that cat faces are a common occurrence in the Cedars spread around that area. Those cat faces are the result of the trees adapting and living through continuous fire over hundreds of years. Obviously, fire or the resulting cat faces have not caused these trees to perish or fall over for the last 100-500+ years - they will not 'spontaneously' react any differently now. As mentioned above, we would not have cut these trees before the Fire and therefore should not be cutting them now simply because they have this common occurrence that may represent an unhealthy tree in other species. The Guidelines do not distinguish between species nor discuss how some of these claimed "defects" are actually part of a tree's natural process and therefore do not warrant a "hazard."

Forest Service Response: Noted that "defects" can also be described as "natural variation," see response to comment A1. The project considers defects in combination with other factors to determine tree weakness and classification as a hazard. If a defect existed prior to the fire and that defect did not contribute to weakness and the fire did not damage that tree to a point where it could be considered a hazard, the tree would not be marked as a hazard. Monitoring mortality is a project action, refer to response to comment 16.

26. Another issue relates to a situation where one portion of the bark (maybe 25% at the base) of a large, perhaps 100-200+ year old tree, is fully scorched through whereas the rest of the bark cover (e.g. 75%) is not. This also happens with natural fires where one part of a tree gets the higher severity burn; trees affected in this way may adapt and heal by bark from the sides growing around the scorched area, eventually creating a cat face. However, the issue to consider is giving that tree the chance to survive. The FS indicates this project will run for up to 3 years. Foresters indicate that trees of this size, if they did eventually perish from the Fire, would likely take years to fall (naturally they could be monitored in the meantime, as planned by the USFS, plus areas could be closed during storm events as is often done in other USFS Regions). The point is that these trees should not be cut immediately because they pose no immediate threat and there are options to avoid potential threats (e.g. closures during storms); rather, they should be left in place and monitored over the next ~3 years and longer as they may very well live. Decisions to cut such old trees that have lived through centuries and survived the Comstock Area should NOT be based on commercial value. (See comments regarding costs below).

Forest Service Response: Refer to response to comment A25. Research referenced in the response to comment A1 indicates that factors such as tree size, species, cause of mortality, and other considerations affect the timing of when a tree falls. According to the research there is no one size fits all approach to determine when a tree falls. If the tree dies and has a potential target such as a human or property this project addresses the need to remove the hazard. The project marking guidelines do not assess the monetary value of a tree when determining hazard.

27. The USFS needs to clarify the difference between insect and disease which does not harm a tree's ability to survive versus the level or extent that would certainly kill the

tree or pose a threat of spreading to other trees. Some insect activity on a tree is not harmful; therefore, this guideline requires more definition.

Forest Service Response: Comment Noted.

28. The USFS needs to clarify how "defects" (rather, "natural variations") such as "bole cracks, cankers cat faces, loose or missing bark, and trees with enough decay to significantly reduce structural soundness" will be assessed in terms of what truly represents an imminent "hazard" of falling versus what is unthreatening natural variation. As mentioned before, the public has been provided with no information to explain how the USFS will asses these matters. In fact, the public has been told that trees already cut in the earlier hazard tree removal activities which had healthy cambiums in tact and existing in areas with low to moderate fire severity (thus they clearly had needles present) "must have had some other defect besides being burned" – yet the USFS said no records were kept by those marking these trees. How is the public to truly review this proposal if this information is not available? Further yet, because the public has already seen trees with healthy cambiums cut down with no explanation for why, the USFS needs to be more understanding of the public's right to review this information for this project and the public's desire to leave living trees as well as those that still have a chance of living.

Forest Service Response: Comment noted, see response to comment A25.

29. On page 2, the Proposed Action states that "…Stressed trees with green foliage may die within three years if severe cambium scorch occurred, nutrient transport is lacking and less than average precipitation occurs in years leading up to and after the fire. Green trees (trees possessing green foliage) that die and become hazard trees would subsequently be removed or mitigated by felling through this project."
a. This acknowledges that the USFS expects to leave trees that "have a chance" of living for up to 3 years to give them the opportunity to survive. If they die, then it would make sense to remove or fell the hazard tree at that point. This relates to several of the comments on the guidelines that trees not be removed immediately if there's *any* chance they will survive. Combined with public concern over the removal of trees that survived/were likely to survive over the past several months, the USFS needs to take this very seriously and not rush to cut down trees that may survive for the sake of a rather small increase in profit (see comments regarding cost below).

Forest Service Response: Comment noted and addressed using the Appendix A Hazard Tree Marking Guidelines based on current scientific research. The Forest Service has disclosed the fact that we are giving trees the benefit of the doubt and that monitoring is included in the environmental document. See response to A26.

30. In the next paragraph, the document explains that "New landing construction would occur in a manner to locate landings in existing openings where cut live trees would be minimized."
b. The USFS must evaluate and give due consideration to all feasible alternatives to cutting any live trees. Live trees should never be cut if a feasible alternative exists (even if it costs a bit more – although as explained below, sparing a few trees here and there will not result in much overall change in costs).

Forest Service Response: The Forest Service has disclosed that there are some non-hazard trees that could be cut to safely facilitate the removal of hazard trees. The amount that would be removed is small. On page 6 of the pre-decisional memo it states the following:

- "Utilize approximately two existing landings and two new landings. Based on field surveys, Unit 5 landings will require that up to 10 non-hazard trees (all of which are less than 23" diameter) be cut to safely facilitate the processing of trees at the landing per OSHA standards."

According to field reconnaissance unit 5 should be the only unit in which some non-hazard trees may need removal.

31. Regarding Unit 2a, the USFS should explain why tree removal activities have already been occurring in these areas over the last two months, and how these tree removal activities compare to the final prescriptions yet to be approved in this project. For example, trees have been cut in conflict with the July 2007 proposed guidelines as well as the current proposed guidelines. Besides the fact that no activities should have been occurring in this unit until after this project was approved after the 30 day comment period, the activities which have been performed are in conflict with every set of tree-cutting guidelines provided by the USFS (e.g. proposed guidelines for this project, guidelines used for the more immediate removal of trees next to paved roads and homes, etc.). This has clearly affected the public's trust of these hazard tree activities and the USFS must be more sensitive to this if this project moves forward.

Forest Service Response: The Forest Service initiated hazard tree removal on FS urban lots and parcels later in the summer and into fall of 2007. These activities were covered under the Forest Service Urban Lot EA. As a result there was about 200 feet of overlap with this project as a portion of FS road 12N19A is also within the urban lot boundary. Hazard trees were not removed through this project but instead with the FS Urban Lot Hazard Tree removal. In addition, there were some hazard trees cut an left in project area for BAER work.

32. The project fails to disclose the costs for timber volume by species and by size. This needs to be included and made available. Estimated income for all individual trees over 30" dbh must be included (along with the reasons each tree is a 'hazard' – as explained in the previous comments regarding marking guidelines).

Forest Service Response: The project purpose and need is not driven by maximizing the economic value of trees. Hazard trees removed through the project could offset removal costs. The Forest Service has disclosed the amount of volume by species to be removed through the project. Refer to response to comment A16. The economic analysis for the project was performed using the USFS Sale Economic Evaluation Spreadsheet (SEES) (v. 1.0, 2007). The SEES is designed to estimate the economic viability of Federal government timber sales. It uses the residual value method which starts with the selling price of lumber, subtracts costs of manufacturing and harvesting, to come up with a fair market value of the products from a sale. The SEES accounts for tree species in its cost evaluation. Costs for hazard tree removal with the project are summarized in the Economic Analysis found in the pre-decisional

memo on page 14 and 15 and Table 2. More detailed costs associated with the economic analysis using SEES can be found in the project record. *While costs were disclosed in the pre-decisional memo, the actual costs for removal are determined at the time of assembling a contract.*

33. We are also concerned that large trees that have lived for hundreds of years, through countless fires, will be cut for their commercial value. If there is any question of whether such trees will survive, they should be left in place and monitored over the next three years, as the USFS has stated they will do for the project. Evidence indicates that trees which should have been left in place have already been cut in numerous other areas, therefore creating the basis for our concern. Worse yet, some of these trees that were cut, for example, Incense Cedars that were hundreds of years old, do not even affect the economic situation all that much. For example, a rough estimate of current profit from an Incense Cedar suggests the USFS would receive $500 per 1,000 board feet. Considering the way cedars grow, the net material from a Cedar that may be ~40-70" dbh (again, hundreds of years old), may be about 1,000 board feet. However, the costs of harvest and hauling may be about $300 per 1,000 board feet. That leaves a "profit" of $200 for that tree. That is bad enough. But considering trees that age may not be fully solid throughout the trunk, there may only be about 500 board feet of commercial/merchantable value, thus the net "profit" would be $100. It is unconscionable to cut a tree that has lived for hundreds of years for any profit, let alone for a mere profit of $100 or $200.
Along those lines, our greatest concern regarding the cuts we have seen is based on large trees that were 100 to 300+ years old which were cut, yet show healthy cambium layers. Such large trees are unfortunately quite rare in the Basin since so many were cut during the Comstock Era. Therefore, if the relatively fewer larger trees of concern were left in place, the overall profit from selling trees (roughly around $700,000 per the proposed project) would not be affected all that much. This just further reiterates how trees should not be cut for their commercial value. If they are alive, leave them there. If they have a chance of living, leave them there and monitor them for the next three years. If we were to go ahead and assume that there are threats to people from hazardous trees along USFS system roads and trails (although we still question this in the face of no evidence), then another consideration would be the frequency of use of these unpaved roads and trails. When marking trees for removal, especially involving large (and rare) "old growth" type trees, foresters who mark the trees must consider the relative frequency of the road and trail use. For example, what is the likelihood of someone being on the trail when a tree falls or limbs and tops fail? Other calculations in the Basin of this likelihood reveal that one is more likely to be struck by lightning than a falling tree on a FS trail. This further contributes to our concern regarding the worth of cutting a specimen tree in light of such minute, and possibly non-existent "threats," when one considers its multiple other environmental, social and spiritual values.

Forest Service Response: See response to A32. Concerns over large trees and trees with spiritual value and character are noted. The project through implementation of marking guidelines with professional foresters would mitigate and remove Hazard Trees. As reiterated from before, the marking guidelines take into account several factors when determining hazard trees.

34. This project does not hew to the criteria of the 1988 LTBMU Land and Resource Management Plan which listed as its first priority the protection of the water quality of Lake Tahoe due to the national interest in protecting Lake Tahoe.

Forest Service Response: Comment noted, the project is consistent with the 1988 LTBMU Forest Plan for Water Quality Maintenance and Improvement. The project provides that mechanical treatment activities do not take place on highly erosive soils as described in terms of land capability classes. The project includes rehabilitation measures and best management practices as design features that would ensure that permanent land disturbance and impervious surface coverage does not exceed that recommended by land capability coverage. The proposed project includes BMPs as design features. The proposed project mechanical work would generally not take place from October 15-May 1 unless conditions allow that do not disturb the soil. Erosion protection measures would be incorporated as BMP design features. The project does not include any activities that manage SEZs outside of their natural hydrologic condition. The identification and mapping of SEZs will be determined through a combination of accepted methods along with ground truthing and soil scientist/hydrologist review.

B. **Mr. Chad Hanson-John Muir Project**

1. Please do not allow trees with any remaining green foliage to be considered "dead or dying" for the purposes of felling and removal through salvage logging, or hazard tree removal. My research has found high levels of flushing (from surviving terminal buds) and survival of ponderosa and Jeffrey pines (in the year following the fire) that had 100% initial crown scorch (0% green foliage, needles scorched brown), for trees that had low levels of crown incineration (black needles). See Odion and Hanson (2006) (attached as Attachment #1). At two years post-fire we found much higher levels of survival for such trees than those reported by Hood et al. (2007)—a data set that does not meet the most basic standards for scientific data collection and analysis, and which contained numerous methodological errors which resulted in overprediction of mortality levels (see below).

Forest Service Response: The hazard tree definition and marking guidelines are shown in the environmental document under the proposed action and Appendix A. respectively. Hazard trees can contain dead, dying, or deteriorating live trees that because of a wildfire or other disturbance factor pose a threat to human life or property. The accurate prediction of tree mortality in the aftermath of wildfire has been an on-going effort by researchers and foresters for many years. As such, the project has used research from the USDA Forest Service Forest Health Protection, Region 5, 2007, report # R0-07-01 and Cluck and Woodruff (2007) to determine project specific marking guidelines for what constitutes a hazard tree. Crown scorch in terms of height of scorch or volume of scorch is the most effective, easiest to use and most popular indicator in predicting post-fire mortality. The marking guidelines for the project account for several other factors that when assessed together give an indication of tree survivability and subsequent indications of tree hazard.

According to Safford et. Al (2007), the conclusions made by Odion and Hanson (2006) are predicated on BAER soil burn severity maps, which are based primarily on fire effects to soil, not vegetation. Odion and Hanson's use of BAER soil burn severity maps to gauge effects of fire on overstory vegetation constitutes a significant misapplication of these products, and it leads necessarily to invalid conclusions regarding fire effects on vegetation. For the Hood et al. paper (2007), Kevin Ryan, a renowned fire scientist assisted with the study design and Rudy King, a statistician for the Rocky Mountain Research Station provided statistical advice and both reviewed the manuscript.

2. For large trees that are actually dead, if such trees need to be felled as hazard trees, please do not remove such trees but, rather, leave them as large log habitat for small mammals, reptiles and amphibians, and invertebrates.

Forest Service Response: The project contains design features for leaving standing trees and downed logs for wildlife habitat as shown on pages 7 and 8 of the pre-decisional memo. The project area represents about 8% of the total burn area.

3. Please do not remove hazard trees along Maintenance Level 1 or 2 roads, and instead close such roads to travel.

Forest Service Response: Closing roads is outside the scope of this decision. Due to the close proximity to neighborhoods and the urban environment, the road and trail system within the fire area (project) will continue to experience high use from all recreation throughout every season of the year. In response to your first scoping comments, the pre-decisional memo (page 1) included an additional description of the amount and type of use these roads experience as they are highly used travel routes for the administrative use, public use, special use access, and utility access.

4. The post-fire conifer mortality guideline document used by the Forest Service currently for post-fire hazard tree marking (and which is based upon Sheri Smith's data and the resulting Hood et al. study) does not meet basic standards for scientific accuracy and integrity as applied to this proposed project for the following reasons (each of which constitutes a separate "comment"):

The trees upon which this study is based were not selected using either a random or unbiased selection protocol. In other words, not all trees meeting the selection protocol in a given site were included in the study, even before bins were filled. This means that trees were included not on the basis of an unbiased a priori protocol but, rather, on the basis of the whims and potential biases (whether conscious or unconscious) of the field staff collecting the data. This is confirmed in an exchange of emails between myself and Sheri Smith (who designed and co-authored the study), which is included with these comments as Attachment #2. This is a major and fundamental error in terms of universal scientific protocols, and renders the data set unusable. I strongly doubt that this would have occurred if the study had been designed by scientists at the Forest Service's Pacific

Southwest Research Station, rather than through an arm of the Forest Service's timber sales program.

Forest Service Response: ***Your comments that focus on discrediting the Hood et al. study do not focus on the specific marking guidelines developed for this project. The project marking guidelines in Appendix A take into account several factors that are assessed together for determining hazard trees, See response to B1. Responding to Sheri Smith data and the Hood et al. study, Personnel from local forest districts identified sites of mixed fire severity for inclusion in the study. For the Cone and McNally fire, individual fire-injured trees were selected from these areas in an attempt to fill a matrix of different crown and cambium injury levels, size classes, and species. Crews were instructed to fill each category with 30 trees from all the available trees in the area. In any given area, some trees may not have been sampled because they fit into a damage/dbh category that already had an adequate number of samples, or they may have been inadvertently missed as the crew worked the stand. Although the target of 30 trees for every category was not met, this sampling gave us a broad range of fire injuries and size classes needed to test our objectives. For all other fires, crews selected trees with higher levels of crown kill, but were given no size or cambium injury selection criteria.***

There is no connection between any of the authors and the Forest Service's timber program. Sheri Smith and Daniel Cluck are employed by Forest Health Protection, State and Private Forestry, and Sharon Hood is with the Joint Fire Science Lab, at the USFS Rocky Mountain Research Station. In addition, Kevin Ryan, a renowned fire scientist assisted with the study design and Rudy King, a statistician for the Rocky Mountain Research Station provided statistical advice and both reviewed the manuscript.

5. The Forest Service employees hired to collect the field data for the Hood et al. study were not scientists but, rather, seasonal workers or Forest Service timber sale staff. See Attachment #2. As a consequence, the assessments of percent remaining green crown (and, thus, percent crown length kill) were inaccurate, unreliable, and biased, according to data collected by Dr. Ed Royce, a botanist living in the southern Sierra Nevada who conducts post-fire conifer survival research. Specifically, for yellow pine in particular within the McNally data set (the largest of the data sets for yellow pine in the Hood et al study), trees were generally recorded as having substantially LOWER amounts of crown kill than actual (64% average crown kill for the 39 sampled trees versus 88% actual average crown kill), leading to overestimates of mortality for a given crown kill level. See *Earth Island Institute v. U.S. Forest Service*, 442 F.3d 1147, 1162-1163 (9th Cir. 2006). The huge difference in crown kill estimates can only be attributed to measurement errors on the part of the Hood et al. non-scientist field workers, especially since estimates of percent crown volume kill (used by Dr. Royce) and percent crown length kill (used by Hood et al.) produce essentially the same results, and do not vary by more than a couple of percentage points, according to the Hood et al. data. See, e.g., Tables 5 and 7 of the draft Hood et al. study (pertaining to incense-cedar and white fir).

Forest Service Response: Your comments that focus on discrediting the Hood et al. study do not focus on the specific marking guidelines developed for this project. The project marking guidelines in Appendix A take into account several factors that are assessed together for determining hazard trees, See response to B1.

To address the topic of crown scorch, percent crown volume kill and percent crown length killed do not produce the same results. These measurements are not interchangeable in the models and cannot be directly compared to other studies that did not measure crown injury the same way.

All crews were trained on how to measure fire injury and spot checks for quality control were completed on each fire and with each crew. The crews used laser range-finders to insure consistency and accuracy in their measurements. We are aware of Mr. Royce's declaration in the above identified court case and that he personally evaluated 39 yellow pine on the McNally fire that were part of the data base for the "Hood Study" and that "he found evidence of measurement errors…". Although the court accepted Mr. Royce's declaration, we have no way of verifying the accuracy of Mr. Royce's estimates, nor do we know how Mr. Royce selected for sampling the 39 yellow pines out of the 1,046 yellow pine on the McNally fire that were included in the "Hood Study". In addition, Mr. Royce's measurements were not collected the same year as those in the Hood Study. Changes in tree crowns post-fire on live trees would be expected each year as new needles are added, older needles drop off and the fire-killed branches/twigs/needles would also drop off over time. Other authors have observed difficulty in estimating crown scorch several years post fire (Hanson and North 2006). We remain unconvinced that there was a significant data collection error in the "Hood Study".

Use of trained seasonal workers and/or students is a common research practice in the labor- intensive process of collecting research data on hundreds or thousands of individual trees. It is interesting to note that the field collection of data for one of the research studies (McHugh and Kolb, p 20) that Mr. Hanson cites in support of his viewpoint was accomplished through the use of timber marking crews on the Kaibab National Forest and the Coconino National Forest. It is also interesting to note that Mr. Hanson offers for our acceptance a paper for which he collected the field data and co-authored as a student (Hanson and North 2006).

The Hood et al. study results are based upon conifers for which destructive cambial sampling was conducted in four quadrants around the base of each tree. This was done primarily with a large drill (creating holes 1" in diameter), which not only damages remaining cambial tissue, but also further stresses already stressed trees and generates pitch, which attracts bark beetles. This practice would have influenced conifer mortality, and results from the Hood et al. study cannot be extrapolated or applied to trees without this destructive cambial sampling, as the Hood et al. results would tend to overstate mortality rates at a given levels of fire damage. Also, on some of my surveys within the McNally fire area, I found that a number of Sheri Smith's trees had been chopped with hatchets in addition to being damaged by the large-bore drills.

Forest Service Response: The project marking guidelines do not require destructive sampling. See response to B1 and B5. In the Hood, Smith and Cluck (2007) study the

cambium was sampled in the center of each quadrant to obtain a cambium kill rating (CKR) for each tree. This was accomplished by drilling through the bark to the sapwood, within 7.5 cm of ground-line, using a power drill equipped with a 2.5 cm hole-saw bit.

Several researchers use cambium sampling as part of their study methods for monitoring fire injured trees (Bevins 1980; Wagener 1961; Ryan et al. 1988; Ryan & Frandsen 1991; Ryan 2000; Weatherby et al. 2001; Ryan and Hood 2001, unpublished study plan 2001.) Comparable to the results from cambium sampling conducted in the Hood, Smith and Cluck (2006) study, none of these authors report an increase in incidence of mortality associated with cambium sampling. Tree mortality resulting from fire-killed cambium is not uncommon in trees that have very little or no crown scorch. Ryan et al. (1988) concluded that the number of dead cambium samples was the most important predictor of mortality for trees included in their study. In addition, these same authors went on to caution land managers that large numbers of trees may be inappropriately marked if cambium damage is not considered.

Furthermore, none of the authors that used cambium sampling (Bevins 1980; Wagener 1961; Ryan et al. 1988; Ryan & Frandsen 1991; Ryan 2000; Weatherby et al. 2001; Ryan and Hood 2001, unpublished study plan 2001) in their studies indicated any increase in bark beetle activity associated with the sampling. These authors' findings in relation to bark beetles and cambium sampling are also comparable to the results from cambium sampling conducted in the Hood, Smith and Cluck study.

Mr. Hanson offers no evidence and sites no references that would indicate that cambial sampling has any measurable effect upon the post-fire survivability of trees. In fact Mr. Hanson's reference (Ryan and Reinhardt, 1988) state that:

> ***"Actual measured cambium injury would undoubtedly be a better predictor of tree mortality than bark thickness" (p 1296)***
>
> ***"cambium injury resulting from low-intensity prescribed fires in Douglas-fir was a stronger predictor of mortality than crown scorch." (p 1291)***

7. The Hood et al. study results, which are presumably relied upon for the marking guidelines for this proposal, likely because of the factors listed above, are dramatically at odds with the published, peer-reviewed scientific literature, which has consistently found much lower mortality levels than those reported by Hood et al. For example:

    i) In Stephens and Finney (2002), ponderosa pines 50 cm dbh in the Sierra Nevada had only a 30% probability of mortality at 80% crown volume kill, and only a 43% probability of mortality at 90% crown volume kill. See Stephens, S.L., and M.A. Finney. 2002. Prescribed Fire Mortality of Sierra Nevada Mixed Conifer Tree Species: Effects of Crown Damage and Forest Floor Combustion. Forest Ecology and Management 162: 261-271. Your mortality guidelines document claims yellow pine mortality levels two times higher than this for the same levels of crown damage. The fact that the crown damage was

from prescribed fire in the Stephens and Finney (2002) study should not matter, since it caused the same kind of crown damage that can result from wildland fires. Also in Stephens and Finney (2002), white fir 50 cm dbh had only a 38% probability of mortality at 80% crown volume kill, and only a 65% probability of mortality at 90% crown volume kill. Again, your mortality guidelines document, based upon Hood et al. data, claims far higher mortality rates at these levels of crown damage.

Forest Service Response: The marking guidelines for the project are also based upon research from Cluck and Woodruff (2007), See response to B1 and B5. The tree data base used in the development of the marking guidelines represents information collected from over 5,200 trees from 5 California wildfires that have been monitored for 4-7 years stretching from the Sequoia National Forest to the Lassen National Forest. The breadth and scope of the scientific data set used to develop the marking guidelines we propose to use is much more extensive and relevant to the site conditions, tree vigor and climate that characterize the project than the data base used in the documents cited by Mr. Hanson.

For example, the Stephens and Finney (2002) research is based on the monitoring of 905 conifers on 10 hectares in Sequoia National Park for 3 years. The McHugh and Kolb (2003) research is based on data collected from northern Arizona involving two prescribed burns that affected 104 hectares and 1 large wildfire. Monitoring occurred for 3 years after the fires. The Ryan and Reinhardt (1988) information came from 43 prescribed fires in the Pacific Northwest.

Both Stephens and Finney (2002) and McHugh and Kolb (2003) used percent crown volume scorched for all tree species in their models. Hood, Smith and Cluck (2007) used percent crown length killed for all species and developed an additional model for yellow pine using percent crown length scorched. These different variables (percent crown volume scorch and percent crown length killed) do not produce the same results. These measurements are not interchangeable in the models and therefore direct comparisons with other studies that did not measure crown injury the same way should be interpreted very cautiously.

The Hood, Smith and Cluck (2007) yellow pine model using percent crown volume scorched and DBH, developed for the purpose of comparing with other studies for trees equal to 50 cm DBH, was very similar to the model developed by Stephens and Finney (2002). Above 75 percent crown volume scorched, the Hood et al. model predicted slightly higher probabilities of mortality. This discrepancy between predicted probabilities of mortality increases greatly as trees get larger. The lower predicted probabilities in the Stephens and Finney (2002) models compared to the Hood et al.(2007) models may be attributed to the small overlap between the data sets. The Hood et al. (2007) data set contains much larger trees (average of 62.6 cm DBH versus 26.3 cm DBH). For the Hood et al.(2007) white fir model using percent crown volume killed and DBH for trees less than 50 cm DBH, the predicted probabilities of mortality are very similar for all levels of crown injury between models. As trees get larger than 50 cm DBH, the Stephens and Finney model dramatically underestimates tree mortality. As with the case of yellow pine, these differences in predicted probabilities of mortality may be attributed to the Hood et al. (2007) data set containing much larger

trees. The Stephens and Finney (2002) mean DBH for white fir was 20.3 cm compared to a mean of 60.2 cm for the Hood et al. (2007) trees.

The Hood, Smith and Cluck (2007) models predict increasing probabilities of mortality with increasing DBH. This is similar to results in McHugh and Kolb (2003) for ponderosa pine models developed using wildfire alone and prescribed and wildfire combined data sets, but contrary to the prescribed fire models reported in Stephens and Finney (2002) and McHugh and Kolb (2003). Most often, the objective of a prescribed fire is to limit mortality of the overstory while reducing fuel loadings and ingrowth of smaller trees. Therefore, a data set from a prescribed burn likely does not contain many larger, overstory trees with high levels of crown and cambium kill. The differences in tree size and fire type could account for the different effects of DBH when predicting mortality.

8. In McHugh and Kolb, in two wildland fires studied, ponderosa pine with 80% crown volume kill had only a 25% probability of mortality, and only a 45-50% probability of mortality at 90% crown volume kill. See McHugh, C.W., and T.E. Kolb. 2003. Ponderosa pine mortality following fire in northern Arizona. International Journal of Wildland Fire 12: 7-22. McHugh and Kolb (2003) found the same results in the prescribed fire that they studied. The results from McHugh and Kolb (2003) are strikingly similar to those from Stephens and Finney (2002) for ponderosa pine at these levels of crown damage, and confirm far lower mortality rates than those reported by the Hood et al. data set.

Forest Service Response: See response to comment B7 above.

9. In Ryan and Reinhardt (1988), for mature conifers with thicker bark (4-5 cm) at 80% crown volume kill, probability of mortality was only 45-55%. See Ryan, K.C., and E.D. Reinhardt. 1988. Predicting postfire mortality of seven western conifers. Canadian Journal of Forest Research 18: 1291-1297.

Forest Service Response: The only tree species cited in the Ryan and Reinhardt (1988) study that is found in the project area is lodgepole pine. The research used to determine the project specific marking guidelines is more recent and relevant to the project area. See Response to B7 above.

10. In Hanson and North (2006), across the 16 moderate and high scorch plots, 71% and 54%, respectively, of all white fir >50 cm dbh survived and were producing epicormic branches 4 years post-fire with remaining green crown on only 10-20% of total tree height. See Hanson, C.T., and M.P. North. 2006. Post-fire epicormic branching in Sierra Nevada *Abies concolor* (white fir). International Journal of Wildland Fire 15: 31-35. To put this in perspective, in Sheri Smith's Star Fire data set, the pre-fire crowns of mature (>50 cm dbh) white fir were, on average, approximately 65% of total tree height, using the first 50 white fir of the data set (Smith, unpublished data). This means that remaining green crown of 10-20% of total tree height in Hanson and North (2006) approximately corresponds to 69-85% crown length kill in the Hood et al. data set (Sheri Smith's data), yet

most of these trees survived in Hanson and North (2006). In the moderate and high scorch plots in Hanson and North (2006), 89-97% of all live trees had epicormic branching, though epicormic branching appeared not to have begun until 2-3 years post-fire. The evidence indicates that epicormic branching is a sign of post-fire vigor—one which is not accounted for in the Hood et al. data set or its accompanying mortality guidelines. In other words, mature white fir that do produce epicormic branches have fairly high survival rates even at high scorch levels, as discussed above. This suggests that, at a minimum, the Forest Service should wait until at least 2 years post-fire to see which white fir produce epicormic sprouts.

Forest Service Response: See response to B5. The Hood et al. white fir models are based on tree assessment (live or dead) at least three years post-fire; some trees have been monitored for over 6 years. Epicormic branching that occurs post-fire is therefore accounted for because if the tree still has any green foliage (which would include epicormic branching) during the annual assessment, it is recorded as live for the purposes of data analysis in the models. The Hanson and North (2006) work did not assess trees until 3 years post-fire and they only assessed trees with green crowns (the Star Fire burned in 2001 and they collected their data in 2004). Hanson and North (2006) totally ignored the trees that died during the first 3 years post-fire, thus their data provides no relevant information concerning the number or percentage of trees that died during the first 3 years post-fire that may have had some degree of epicormic branching. Hanson and North also noted the difficulty in measuring crown scorch several years after the fire.

11. The scientific studies cited above are distinct from the Hood et al. data set because they: a) used a random or unbiased *a priori* protocol for selecting trees for inclusion in the study (thus eliminating biased data collection); b) did not conduct destructive cambial sampling, which influences the mortality of sampled trees; and c) used a sample distribution that approximates the population distribution for the variables being measured, which is ensured by a random or unbiased sampling protocol (making a fundamental error in statistical analysis, the Hood et al data set arbitrarily categorized the trees into "bins" of roughly equal number, thus preventing a sample distribution that reflects the natural distribution of fire effects on the trees in the population being sampled—the result of which, again, is an overestimation of mortality, given that most of the trees in the fires sampled actually had much lower levels of crown scorch and crown kill--and almost certainly lower levels of cambial kill as well—than the mean crown scorch, crown kill, and cambial kill in the arbitrary bin categories). This third point is particularly important. Most mature conifers, even with high levels of crown scorch, have relatively low levels of cambial tissue damage, due to thick bark which protects these trees. See Peterson, D.L., and K.C. Ryan. 1986. Modeling postfire conifer mortality for long-range planning. Environmental Management 10: 797-808. (see also Ryan and Reinhardt 1988). Hood et al's act of putting the trees into bins means that the sample distribution for trees 20-30 inches in diameter with, for example, 80-90% crown kill, is 20% with 0% cambial kill, 20% with 25% cambial kill, 20% with 50% cambial kill, 20% with 75%

cambial kill, and 20% with 100% cambial kill. In the actual population, trees 20-30 inches in diameter with 80-90% crown kill will have a cambial kill distribution that is much more heavily skewed toward lower levels of cambial kill (mostly 0% or 25%, with increasingly smaller proportions of such trees with 50%, 75%, and 100% cambial kill, respectively). This is a fundamental error of statistical analysis. In all scientific statistical analysis, the sample distribution must represent the population distribution. The effect of this is serious. It's sort of like someone going into a cancer ward in a hospital and tabulating mortality rates, and then extrapolating these rates to the overall population of the city in which the hospital is located. Doing so would dramatically overpredict mortality rates of the population. In the For these reasons, the Hood et al. data set should not be used to predict mortality on this project.

Forest Service Response: See responses to comments B1 and B7-10 above. The marking guidelines used in this project are adapted from the USDA Forest Service Forest Health Protection, Region 5, 2007, report # R0-07-01 as project specific marking guidelines for what constitutes a hazard tree. This report determines marking guidelines based on the best available science for fire injured trees in CA. Guidelines are also based on probability of mortality models that were developed from the largest dataset available for CA (over 5,200 trees) and the study trees span the largest geographic area (5 fires located from the Lassen NF to the Sequoia NF). They have been developed with full consideration of additional available literature, on-going studies, and the professional judgment of people with years of experience.

12. The 2004 Framework ROD specifically incorporated the population monitoring requirements of Appendix E of the 2001 Framework FEIS. The MIS and SAR species which have a check mark under the column heading "Population Monitoring" are required to have their populations monitored. *Earth Island Institute v. U.S. Forest Service*, 442 F.3d 1147, 1173-1176 (9th Cir. 2006). These include numerous species dependent upon snags and burned forest—species which would be harmed by salvage logging. The Forest Service has failed to conduct this monitoring, and thus cannot continue to log the habitat of these species without risking a threat to their viability. *Earth Island Institute v. U.S. Forest Service*, 442 F.3d 1147, 1173-1176 (9th Cir. 2006). Such species include, but are not limited to, the following:

a) Hairy Woodpecker (Smucker et al. 2005).

b) Olive-sided Flycatcher (Smucker et al. 2005). This species is also highly vulnerable to the "ecological trap" created by logging and salvage logging, which results in open habitat that can superficially appear to be suitable, but which does not sustain populations. See Altman and Sallabanks (2000); Hutto (1995). In the Sierra Nevada, which is the core and heart of this species' North American range, it depends overwhelmingly upon flying beetles, particularly bark beetles, for its food source (Altman and Sallabanks 2000), thus removal of snags, upon which the bark beetles depend, will necessarily degrade or eliminate its foraging potential.

c) The Silver-haired Bat and Long-legged Myotis (bat) are dependent upon large snags for roosting, and removal of large snags is the primary risk factor for these SAR species, according to the 2001 Framework, Vol. 3, Chpt. 3, part 4.5, pp. 21-30. Also, the Forest Service's practice of herbicide application following salvage logging and replanting would tend to reduce or eliminate the native flowering plants upon which the insect prey species for these bats depend, and salvage logging itself removes the substrate upon which native bark beetles depend, thus reducing the abundance of these flying insects and, consequently, reducing bat foraging potential.

Forest Service Response: For the Lake Tahoe Basin Management Unit (LTBMU) project level analysis, the population monitoring requirements that are referred to in the comment above (from Appendix E of the 2001 Framework FEIS as adopted by the 2004 Framework ROD) ONLY apply to the 13 species listed as MIS in the Land and Resource Management Plan for LTBMU (LMRP 1988; pg III-7 and III-23). The species referred to in the comment above are not listed as MIS in the LMRP for LTBMU, hence they are not subject to the population monitoring requirements indicated.

Monitoring requirements for MIS species listed in the LMRP (1988) that are not also listed in Appendix E of the 2001 Framework FEIS default to requirements specified in the LMRP (1988; pg V-7 and V-8). All species listed as MIS for LTBMU in the LMRP (1988) were analyzed in the Angora Fire Hazard Tree Removal project MIS report and the required level of monitoring (as indicated in either Appendix E of the 2001 Framework FEIS OR LMRP 1988) is discussed for each species, respectively.

Your concerns regarding the threat of the Angora Fire Hazard Tree Removal project to viability of the Hairy Woodpecker, Olive-sided Flycatcher, Silver-haired Bat and Long-legged Myotis have been noted. We recognize that both hairy woodpecker and olive-sided flycatcher are two of several species that have been known to demonstrate increases in abundance after fire. We also recognize the importance of large snags as potential roost sites for silver-haired bat and Long-legged Myotis.

Of critical importance to the impact analysis of this project to wildlife is that the Angora Fire Hazard Tree Removal project does not propose actions throughout the entire Angora fire area, but instead only proposes to remove hazard trees (those without green needles and/or with severely compromised structural integrity) within 150 ft of system roads and trails, an area of approximately 260 acres. This amounts to only ~8.5% of the entire burned area (~3070 acres), therefore, it is not likely that the proposed actions as part of this project will significantly alter the suitability of the entire post-fire landscape to the species you indicated. Further, a mixture of fire severity types is represented both within and outside of the proposed treatment area for this project (i.e., 260 acres along forest service system roads and trails); the project area does not encompass a disproportionate amount of any one single fire severity type relative to what is present throughout the entire Angora fire area. Therefore this project will still allow for diverse responses of wildlife to multiple fire severities within the Angora fire area.

As indicated in the project design features (see Predecisional memo; pages 6-13), several important habitat elements (e.g., large diameter woody debris and non-hazard snags including large, structurally sound snags and snags with broken tops or other features of decadence) will be retained when possible within the project area to limit potential impacts to species within the project area.

Lastly, the practice of herbicide application following salvage logging and replanting is not a part of the proposed action in this project, therefore, this comment is not applicable.

13. For the foregoing reasons, this project is controversial and has potentially significant adverse environmental impacts. It cannot be done through a CE, and an EA or EIS must be prepared. Further, please notify me as to whether you also intend to propose a similar salvage logging project in the fire area (if so, this would further necessitate an EA or EIS, not a CE—the CE regulations prohibit segmentation of analysis).

Forest Service Response: The project area encompasses approximately 260 acres of highly used Forest Service System roads and trails of the 3100 acre Angora Fire. Within the 260 acre project area, about 175 acres are proposed for mechanical removal and hand felling of dead or dying trees, while 85 acres proposed have no immediate action other than monitoring of mortality. According to the BAER assessment of vegetation severity that occurred four days after the Angora Fire and using Landsat imagery, 166 acres or 64% of the project area is classified as having greater than 75% basal area mortality, 41 acres having 25-75% basal area mortality, 36 acres having 0-25% basal area mortality, and 18 acres having no basal area mortality. The high vegetation severity areas (> 75% basal area mortality) of the project correspond to the mechanical removal portion of the project described above. The moderate to low vegetation severity areas (<75% basal area mortality) correspond to the project acreage that would be monitored for any delayed tree mortality and subsequent hazard trees following the Angora Fire.

The project's proposed action and purpose and need are also consistent with Forest Service Handbook (FSH) 1909.15 chapter 31.12 for NEPA analysis using category 11. Category 11 includes Post-fire rehabilitation activities, not to exceed 4,200 acres (such as tree planting, fence replacement, habitat restoration, heritage site restoration, repair of roads and trails, and repair of damage to minor facilities such as campgrounds), to repair or improve lands unlikely to recover to a management approved condition from wildland fire damage, or to repair or replace minor facilities damaged by the fire. The management approved condition for this project is removal and mitigation of hazard trees along the road and trail system and rehabilitation of system roads and trails impacted by project activities.

The Forest Service Interdisciplinary Team (IDT) determined that there were no extraordinary circumstances related to the project that may result in a significant individual or cumulative effect on the quality of the human environment. Therefore, there are no significant environmental impacts with the project. Complete project analysis and reports are available in the project record. The analysis found within the reports informs and discloses the effect to the environment for the interested public and provides informed decision-making to the Forest Supervisor.

At this moment, the Forest Service has not determined a proposed project for restoration of the Angora Fire area. It is assumed that restoration beyond the urban environment and road and trail system would require an EIS.

14. Please wait to conduct any project activities until at least late spring of 2008, when the extent of "flushing" (from surviving terminal buds in the upper crown) in pines with high or complete (100%) crown scorch (but low levels of crown incineration) can be determined.

Forest Service Response: At the current project schedule, project activities of boundary layout and tree marking would occur during late spring 2008, with advertising and awarding a contract to follow.

C. The Hildingers' (Angora Lakes Resort)

1. We question the cutting of very large trees along Tahoe Mtn. Rd. We request that far more intense supervision by the Forest Service be identified and be a part of the operational contract. If marking and cutting were separated by a thirty day period it would allow for third party inspection before cutting started.

Forest Service Response: Trees marked along Tahoe Mtn. Road were a part of the Urban Lot Hazard Tree Removal project, which is outside the scope of this project. Urban lots are inherently part of an urban environment and as such are close to paved roadways, structures and populated areas. Criteria used to mark trees for removal on Urban Lots are different from the criteria we are using for this project. Criteria used for this project include language to allow only trees that lack green needles to be cut.

2. Nowhere in this document does it say that a healthy tree must not be cut. We would like to see language that specifically prevents a healthy tree from being cut, citing the appropriate regulation and applicable penalties.

Forest Service Response: Refer to responses to comments A1. and A6.

D. Carla Ennis

1. If the goal of this project is to protect recreationalists from falling trees, then why are only large diameter trees being taken (as seen already and as specified in your guidelines)? Smaller trees will hurt a hiker just like a large tree and may be more likely to blow down in the wind. I have never read of a single case of a hiker being killed by a falling tree.

Forest Service Response: See response to comments A3, A4, and A19. Large diameter trees are not the only trees being removed through this project. For the purpose of this project a hazard tree is generally defined as a tree that is void of needles or is absent of any green foliage (See DM, Appendix A, Hazard Tree Marking Guidelines) and is

within striking distance of human life or property. Striking distance is considered to be 1 ½ times the height of a tree due to the potential for airborne limbs and the domino effect of one tree striking another. As specified in the marking guidelines (DM, Appendix A) trees 10" and above are to be marked for removal, but only if they meet the criteria outlined in the marking guidelines. In this case, hazard trees are being marked for removal along roads and trails because the sheer number of dead trees due to the Angora Fire has made travel along these routes a hazard. Normally, along roads and trails, there may be a handful of hazard trees which die each year and require removal. In this case there are literally hundreds of hazard trees because of the fire. The potential for a hiker or biker to be struck by a falling tree has increased dramatically.

2. Cutting wide roads, disturbing and compacting soils, working in SEZs, will be a detriment to water quality, destroy remaining vegetation, and contribute to erosion and to the mobilization of fine ash. Please explain how the use of commercial logging equipment will be better than chipping down trees to create useable biomass. Removing all the trees proposed for removal in this overreaching document will result in extreme, unacceptable and probably illegal damage to soils, especially in SEZs.

Forest Service Response: Refer to response to comment A4 and A9. Trees proposed for removal as a part of this document will be removed in conjunction with carefully designed and implemented project design features, which include measures to reduce damage to soils, especially in SEZ areas. Design features for SEZ areas include no equipment entering the area and provisions for leaving downed trees to minimize exposure to bare soil (See project design features for soil and hydrology, pages 8-10). Removing some hazard trees is important for leaving fuel loading within reasonable levels for the wildland urban interface. Leaving trees and or chipping could lead to increased loading of surface fuels that are homogenous and pose a risk to future fire severity, suppression difficulties, and inhibit growth of vegetation.

3. The Tahoe basin receives millions of Federal dollars annually for environmental improvement projects. The project your agency proposes will damage the environment and then require more taxpayer dollars to mitigate the damage done by logging companies. What kind of sense does that make for the taxpayer?

Forest Service Response: See response to comment A6 and A7 and project Purpose and Need.

4. Exactly where will trails and roads be widened to 15 feet or more? We want to know exactly where these wide roads will be created and request a meeting with the appropriate staffer to have this pinpointed on a decipherable trail map. We will want to do this before the project is started.

Forest Service Response: See response to comment A9.

5. Residents are very concerned about wide roads, soil disturbance, SEZ damage and demand a comparison between damage done by traditional logging and the use of smaller equipment, chipping vs hauling, hand thinning and leaving some logs on the ground to regenerate soils.

Forest Service Response: See response to comment A9 and A12.

6. You must disclose how many trees exceeding 30" in diameter will be marked, their species, the reason for the mark and the commercial value. The public needs to know much more about what you are doing, how it will protect the public, what trees will be taken and the rationale for it.

Forest Service Response: See response to comment A14, project Purpose and Need and marking guidelines in Appendix A of pre-decisional memo and decision memo.

7. If an area is too densely forested to use mechanical equipment without damaging any living trees then hand thinning should be used. We already legitimately lost too many precious trees during the Fire; we should be doing everything to preserve the ones we still have.

Forest Service Response: See response to Sierra Forest Legacy and Sierra Club comment A14 and A17. Mechanical operations inherently involve some risk of mechanical damage to adjacent trees.

8. The public does not have enough information to assess this project and FS has not gained the public's trust with their activities to date. We ask that trees be marked and that the public or at least the Sierra Forest Legacy and Sierra Club staff and other foresters have a chance to review the entire project before it is undertaken.

Forest Service Response: See response to comment A4, A20, and D10.

9. Because there is no shortage of excuses for cutting trees, especially large old growth trees, we request that any living tree in the fire zone be left and any tree that is "questionable" be given a chance to live. Losses from the fire are great and to make them greater by cutting green trees and creating massive soil disturbances is unacceptable. Trees can be monitored over the next few years to assess their health and then be cut only if there is no alternative.

Forest Service Response: See response to Sierra Forest Legacy and Sierra Club comment A1 A3-6, A15 and A21.

10. We strongly urge you to exhibit integrity and transparency in dealing with an especially sensitive environmental and social situation.

Forest Service Response: The project has gone through the NEPA process which requires public comment. Scoping letters outlining this project were mailed to 42 individuals and organizations on July 19, 2007. The project proposed action along with a news release were posted on the LTBMU website for scoping on July 26, 2007 and a news release for scoping was published in the Tahoe Daily Tribune on July 30, 2007. In addition, a field visit that was initiated by the Forest Service Project Leader per discussions with the public occurred on August 24, 2007 to portions of the project area. The field visit included two Forest Service specialists working on the project, two members of the public (including yourself), and two representatives from environmental groups. A 30-Day Comment period was commenced on October 25, 2007. The 30-Day Comment period consisted of sending the predecisional memo to those individuals and organizations on the scoping list along with posting the document to the LTBMU website and publishing both a legal notice of the opportunity

to comment and providing a press release on the project. At the request of yourself and environmental groups the Forest Supervisor, Project Leader and Public Affairs Officer met with you to discuss the project and marking guidelines. This project has also been listed on the LTBMU Schedule of Proposed Actions since October 1, 2007. Through these methods we have provided numerous opportunities to the public to review and comment on this project.

E. Lahontan Water Quality Control Board

1. Comment: Lake Tahoe is federally designated as an Outstanding National Resource Water (ONRW). The Clean Water Act allows no degradation of ONRW water bodies. Lake Tahoe is listed as an impaired water body for excessive sediment, phosphorus, and/or nitrogen pursuant to Section 303(d) of the federal Clean Water Act. The Water Quality Control Plan for the Lahontan Region (Basin Plan) (p.3-2) also requires that in situations where water quality standards are already being violated, "controllable human activities shall not cause further degradation of water quality in either surface or ground waters." Based on my understanding that the Forest Service must comply with all Federal and State laws and regulations you must therefore design and implement the project to avoid increasing discharges of sediment and nutrients to surface and ground waters of the Lake Tahoe Basin.

   Forest Service Response: The Angora Hazard Tree Removal Project was designed to avoid increasing discharges of sediment and nutrients to adjacent surface waters. Numerous unit specific and project wide design features were developed to minimize sediment source throughout the project area (Pre-Decisional memo pgs. 8-13). In addition, a list of standard BMPs and those developed specific for this project are included in the Proposed Action as an appendix (Appendix B). Due to the sensitivity of the area, being that it recently burned in a wildfire, more stringent design features and BMPs were developed for this project than would normally be followed for fuel reduction activities.

2. Comment: It is anticipated that increased levels of sediment and nutrients related to the Angora Fire will be discharged to Lake Tahoe during future years. Any activities that are conducted within the burned area should include restoration of the area, and prevention of any additional discharges as significant project components.

   Forest Service Response: The area impacted by hazard tree removal will be minimized through application of prescribed design features and BMPs. In addition, areas that are disturbed by mechanical equipment operations will be restored to the pre-existing condition (or better) by not only decompacting areas that exhibit soil compaction but also by providing ground cover where there currently is very little.

3. Comment: Water Board staff are interested in the USFS planning any hazard tree salvage logging efforts to minimize disturbance to areas that are starting to revegetate or where best management practices (BMPs) or other erosion control measures have been installed.

   Forest Service Response: The project would remove hazard trees along system roads and trails in the burned area. This amounts to a very minor component of the total area burned (approximately 8 % of fire area), with the majority of the new vegetation

not being affected by project operations. The layout of skidding and forwarding trails would affect less than 15% of each project area unit. We would not mitigate by re-vegetating at this level and project design features would meet the need for stabilizing the area. Where BMPs and other erosion control measures have been installed within the project area and are disturbed by project operations, they will be re-installed after project implementation in each unit.

4. Comment: Water Board staff would like to see a comprehensive analysis of vegetation re-growth where salvage logging occurs or doesn't occur.

Forest Service Response: The project would remove trees using salvage in select units as specified in the decision memo. The project does not include planting vegetation as a rehabilitation activity. It is being considered through long term restoration planning to reforest portions of the burned area with conifers. See response to comment E3 above.

5. Comment: Operations that are conducted over snow and do not cause ground disturbance or inhibit vegetation re-growth would be preferred if over the snow logging conditions occur during the project's implementation period.

Response: Over the snow operations are permitted with the environmental documentation for this project. The likelihood of over snow occurring at this time is minimal. This is due to the fact that project decision is now expected in March and tree marking needs to occur as well as advertising and awarding contracts takes some time. Once this takes place, Spring conditions may prohibit over-snow operations. In addition, the access of haul routes for landing access is unreliable and lacking when snow is present and saturated haul routes are present. The project would likely take place under dry conditions later in the spring and summer.

6. Comment: Alternatively the hazard tree logging plan should include limitations on logging or yarding if such actions cannot be done without impacts to natural revegetation.

Forest Service Response: See response to comment E3 and E4 above. Impacts to natural re-vegetation are expected in any project of this scope, and vegetation would respond by growing in areas impacted by project activities (as described above).

7. Comment: It is our understanding that the BAER team conducted an analysis of predicted erosion for the burned area using the GEOWEPP model. Did this modeling include runs with different levels of vegetation? Please include discussion related to predicted sedimentation with varying levels of vegetation in the planning/decision document for this project.

Forest Service Response: The BAER team actually performed modeling analysis for the Angora burn area using the ERMIT-BAER-WEPP model, not GEOWEPP. The ERMIT version of WEPP was designed for forest wildfire erosion analysis in specific. Rather than having input parameters for vegetative cover, it allows the user to specify the fire severity class experienced and to evaluate the response to various typical postfire erosion mitigation treatments. For the BAER analysis for the Angora fire, the mitigation treatment was assumed to be mulching at 2 tons/acre for the modeled simulations.

WEPP modeling was not conducted for this Hazard Tree Removal Project because of the linear treatment areas, only along system roads and trails. The WEPP model was designed for hillslope simulations, where a natural break in slope separates the hillslopes and dictates the erosion response. Application of this model for a 150 ft segment of hillslope on either side of a road or trail would not result in accurate depictions of erosion response. In order to predict sedimentation for this project, the Erosion Hazard Rating methodology (FSH 2509.22) was applied to the steepest, longest hillslopes found within each treatment unit. The results of the EHR analysis were used to prescribe the necessary percent cover with masticated or shipped material required to avoid increasing the EHR value. The details of this analysis and the results obtained can be found in the Soil and Hydrology Specialist Report.

8. Comment: In areas where vegetation has recovered and will be disturbed by salvage logging activities, please describe what mitigation measures will be incorporated into the project design to prevent any discharge.

Forest Service Response: Mitigation measures for preventing sediment discharge were built into the project as design features and can be found on pages 10-13 of the Pre-Decisional Memo. In specific, the design features that identified the percent ground cover needed based on slope in each unit were determined using the Erosion Hazard Rating methodology (FSH 2509.22). This protocol was used to evaluate the likelihood of erosion and sediment delivery on the steepest and longest hillslopes found in each treatment unit, in order to characterize the worst case scenario. Based on the results of the EHR evaluations, ground cover was prescribed to mitigate for the assumed loss of existing shrub and/or canopy cover from mechanical equipment operations. The percent cover listed in the design features represent what is needed to avoid shifting the EHR values toward a moderate or high erosion hazard rating.

9. Comment: Mastication is mentioned as a treatment method for some of the less merchantable burned material. Will this occur prior to ground based equipment accessing merchantable trees - so a woody mulch layer will be available for equipment to operate on, thereby reducing soil disturbance?

Forest Service Response: The objective of mastication is to provide soil cover once removal activities are finished. Where a masticator or chipper is used in this project, it will be used as secondary treatment. The masticator/chipper would treat the areas after removal activities leaving a fuel load that is within project design standards, while leaving the project area with adequate ground cover to protect the site from soil disturbance.

10. Comment: Appendix A of the scoping notice is described as the hazard tree marking guidelines, by species, that will be used for marking harvest trees associated with this project. This appendix does not provide species specific guidance. The state guidelines seem to allow for the harvest of trees that may survive and provide soil stabilization to an already disturbed area. Some conifer species with a slight lean, forked tops or cat faces have benefit to the general forest environment and should be left if the tree has not suffered mortal or significant damage as a result of the fire. The scoping proposal states that tree planting would not occur as part of this project. Water board staff request that potential seed trees be specifically marked, by a silviculturist, for retention within the harvest areas to increase the probability of new tree growth in the project area.

Forest Service Response: The project pre-decisional memo was not part of the scoping notice. The scoping notice was mailed to you in late July 2007. You provided written comments to this proposed action in late November. Refer to response to comment A1, A15, and A18. Trees that are not considered hazards would not be cut and removed through the project. Remaining healthy seed producing trees would be available seed sources for natural regeneration. Because the project is not removing healthy seed producing trees there would be no need to perform additional work to mark leave trees, and marking leave trees would not affect the probability of new tree growth in the project area.

11. Comment: The scoping notice does include design features specific by unit for how harvest activities will be carried out. Some of the units have a design feature that requires that hand piling and burning of slash will be located beyond 50 feet of any stream channel or standing water. This should be a universal design feature for all pile burning for this project, and might be better located within the Soils and Hydrology section on pages 8-10 of the scoping notice.

Forest Service Response: The design feature regarding piling and burning of slash 50 feet beyond any stream channel or standing water was only included for treatment units that contained either of these surface water features. Most of the treatment units do not contain stream channels or standing water features.

12. Comment: Bullet 3a on page 9 is very ambiguous regarding the determination of soil moisture conditions that will be evaluated for skidding operations.

Response: The determination of operable soil moisture conditions will be made using the same protocol as used in the past for fuel reduction projects in the LTBMU. The detailed protocol is referenced in this Pre-decisional document, and can be found in the Soils and Hydrology Report. The Soils and Hydrology Report was made available during the 30 day comment period.

13. Comment: Please include discussion regarding the criteria that will be used to determine the need for landing mats in Unit 5 (and Unit 1 if applicable). If soils are too wet for operations without the use of landing mats what kind of monitoring will be conducted to determine if operations with landing mats are causing impact; and what mitigation measures will be applied if it is determined that impacts to the SEZs do occur?

Forest Service Response: The criteria used for determining the need for landing mats will be the same criteria as mentioned in response to comment E12 above (detailed protocol found in Soils and Hydrology Report), which provides a determination of whether or not the soil moisture conditions are operable. Metal landing mats have been used in the Lake Tahoe Basin and have proved successful at preventing damage to soils in the past. Past projects that have used metal landing mats are the Pioneer Hazard Reduction Project (1996) and the Pope Marsh Fuelwood sale during the 1990s. The use of landing mats in these projects was accepted by the Lahontan Water Quality Control Board.

14. Comment: The scoping document states that there is a possibility for multiple entries into the same areas if future fire related mortality warrants it. Please describe the criteria that will be used to assess if the benefit of site recovery exceeds the benefit of removing the additional fuel loading that occurs between entries.

Forest Service Response: Once units are entered with mechanical equipment they would not be re-visited unless there are multiple acres (>10) affected. The units that could be re-vistited would not include unit 2a, 4, and 5, but could include unit 3 and 6.

15. Comment: Please state in the scoping notice that BMPs will be installed and/or maintained every fall during the project's life, regardless if another entry is proposed.

Forest Service Response: Appendix B details the requirements for temporary BMPs. Specifically, BMP#1-13 and 1-20 discuss the timing of installation and maintenance during the life of the timber sale contract. Please refer to comment response E10 for clarification of scoping.

16. Comment: Please also clearly state that the temporary crossings in Unit 5 will be stabilized annually upon crossing removal.

Forest Service Response: Treatment in this unit is not expected to span multiple years, and therefore only in the event of summer storms would the temporary crossings need to be removed and/or stabilized. In the event that summer storms do occur during project implementation, temporary crossings would utilize a drainage structure such as a "pipe" to allow water to flow through the crossing during a storm.

17. Comment: It is unclear from the maps or the text in the scoping notice where all of the possible new landings will be located. Will there be a landing on both sides of the watercourse at points 6 and 11 on Map 4?

Forest Service Response: Proposed landing locations (new and existing) are found in map 1 of the Appendix. Map 4 does not depict landing locations, but was created to show the reader the location of each specific design feature (and associated SEZ or sensitive site) referenced in the document text (pgs.12-13 of Pre-Decisional Memo).

18. Comment: Beyond the measures described relative to scenic resources, how will the new landings be stabilized/rehabilitated after use? Please also describe how sediment discharges from the landings (and roads/skid trails that have the potential to discharge to a watercourse) will be prevented if a precipitation event occurs during periods of operations.

Forest Service Response: Appendix B of the Pre-decisional Memo provides a list of project specific BMPs that will be applied prior to, during and after project implementation. In specific, BMP#1-16 addresses stabilization and rehabilitation of landings. BMP#1-12 addresses potential discharges from landings, and BMP#1-17 addresses potential discharges from roads and skid trails.

19. Comment: Page 5 of the scoping notice lists acreage for Unit 2a. The acreage listed in the initial sentence does not match the acreage listed under the bullets for treatment methods.

Forest Service Response: Comment noted.

20. Comment: Page 6 states that no landings will be constructed for operations in Unit 4, yet page 11 states that up to 1 acre of the area disturbed by forwarding/skidding operations

will be returned to existing grade. Please provide additional detail on where the disturbance would occur.

Forest Service Response: Page 6 also states that whole tree or cut-to-length harvesting would occur where slopes are less than 30% (12 acres total). In the areas where mechanical operations occur, some rehabilitation work may be necessary depending on the level of disturbance. This does not change the fact that landings would not be utilized for treatment in this unit.

21. Comment: Please provide our office with a copy of the Soil and Hydrology Report (project record exhibit B5).

Forest Service Response: Comment noted, report would be provided prior or during project decision.

22. Comment: Please provide sufficient detail and/or justification for us to make findings to allow for an exemption for SEZ operations, if soil disturbance greater than expected by over snow operations will occur.

Forest Service Response: The project is not proposing to utilize equipment operating in SEZs for hazard tree removal. The project would utilize endlining with the equipment being outside of the SEZ. Disturbance created from endlining would be rehabilated as described in the pre-decisional memo on pages 8-10. It is important to note that endlining has been used in several projects in the past. The Pioneer Hazard Reduction Project (1996) is one in which endlining was used near Trout Creek to remove downed trees and logs. The end result of this endlining was no visible evidence that it occurred in the area. Equipment would travel the trail corridor (already compacted and disturbed) and where soils are too moist, SEZ crossings would be established. See pages 8-11 for specific detail of work around SEZs. Findings in the Soil and Hydrology report were made available during this comment period. An excerpt from the pre-decisional memo states:

> "The Forest Service hydrologist, in consultation with Forest Service soil scientist and Tahoe Regional Planning Agency (TRPA) soil scientist conducted field assessments to determine site specific project BMPs and design features as seen below. In addition, a cumulative watershed effects analysis (CWE) was completed as part of the soil and hydrology report (see project record exhibit B5) to determine the impacts from the proposed project on water resources. The proposed treatments, with the proper implementation of design features and applicable BMP's as described in the proposal (See appendix B), are expected to result in little to no increase in erosion or negative impacts to soil and water resources in the area."

The projects primary purpose is to remove hazards along highly used and impacted trails and roads <u>to provide for public safety</u>. The project has been designed with several activities that address the protection of soils and water resources and they are described in the pre-decisional memo. Equipment is not operating within SEZs except for designated trail crossings. At some trail crossings the use of landing mats is specified to occur under certain conditions as a protection measure that can be considered project mitigation. In addition, work around SEZs using equipment endlining is being "mitigated" with raking berms (furrows) in.