APPENDIX E

RESPONSE TO PUBLIC COMMENTS ON BIG GRIZZLY DEIS

INTRODUCTION:

The Draft EIS was available for public review and comment from February 5, 2010 to March 22, 2010. During the comment period the Forest Service heard from 8 individuals or groups. Public concerns reflected a broad range of views related to the Proposed Action. Individual commenters and the comments summated are identified by numbers below.

(1) Comments were submitted on behalf of Californians for Alternatives to Toxins with concerns relative to project impacts that would occur do to pesticide use, identifying insufficient information relative to proposed activities, and requesting additional analysis and review of opposing science.

(2) Comments were submitted on behalf of John Muir Project with concerns relative to project impacts on wildlife, requesting additional information and analysis, and identifying insufficient information in the Draft EIS.

(3) Comments were submitted on behalf of Sierra Forest Legacy, with concerns for impacts on wildlife resulting from implementation of the Proposed Action, requests for additional information and analysis, identifying insufficient information in the Draft EIS and requesting additional alternatives to be analyzed. A follow-up meeting was held with the Director of Sierra Forest Legacy to further clarify issues and points of concern.

(4) Comments were submitted on behalf of Mason, Bruce, and Girard, Inc and (5) Sierra Pacific Industries in support of the Proposed Action. In expressing support for the project, concerns were also raised that the proposed removal of material was very conservative in the Proposed Action.

(6) Comments were submitted by the United States Department of Interior requesting corrections and identifying insufficient information in the Draft EIS specific to the Pacific fisher and California red-legged frog.

(7) Comments were submitted by the United States Fish and Wildlife Service requesting further information on public involvement and issues related to Environmental Justice.

(8) Comments were submitted from the Environmental Protection Agency identifying areas of insufficient information in the Draft EIS.

Comments submitted during the official comment period were reviewed, analyzed, evaluated, and responded to. Comments were considered both individually and collectively and responded to by modifying alternatives, including the Proposed Action; developing and evaluating alternatives not previously given consideration; to supplement, improve, or modify analysis; to make factual corrections; or to explain why the comments do not warrant further agency response.

PESTICIDE USE

Comment 1: Alternative 1 leaves open the possibility for the use of multiple herbicides with repeat applications to be used for a variety of vegetation management needs which are not specifically identified and analyzed. Table 4, Chemical Formulation and Application Rate and Type, And Additives, page 26, is

an example of the lack of specific information and analysis for the proposed action and herbicide portion of the project. Table 4 attempts to outline the two proposed herbicides, the adjuvant and the dye for the project. However, the table allows for various formulations of herbicide be used by stating: "glyphosate (accord or equivalent) and triclopyr (Garlon 4 Ultra or equivalent) as well as adjuvant Syl- Tac or equivalent". What equivalents would be used? Chemical formulations have differing levels of toxicity and environmental fate. The Forest Service must specify what formulations of herbicides they plan on using, including surfactants, adjuvant and dyes for the potential environmental impacts to be understood and for the document to stand. (1)

Response: *Type of herbicide and criteria and location for repeat applications are specifically identified and analyzed for in the Draft EIS, Final EIS, and Project Record. Table 4 in Chapter 2 of the Draft and Final EIS identifies specifically what formulation and quantities of herbicide would be applied with this project. Appendix A, Table A-2 of the Draft and Final EIS specifically identifies in which units each herbicide is proposed for use and the target vegetation for the purpose of release for survival, release for growth, and fuels reduction maintenance. Use of herbicide for noxious weeds was identified for a patch of existing scotch broom in unit 318-017 and a potential site in 329-15.*

The formulation for glyphosate proposed is glyphosate N-(phoshonomethyl) glycine, isopropylamine salt 53.8%; other ingredients 46.2%. The formulation for triclopyr proposed is triclopyr: 3,5,6-trichloro-2- pyridinyloxyacetic acid, butoxyethyl ester 60.45%; other ingredients 39.55%. The formulation for the surfactant proposed is Ethylated seed oil; 3-(3-hydroxypropyl)-heptamethyltrisiloxate, ethoxylated acetate; polyoxyethylene dioleate: Polyol alkyl ethoxylate 100%.

The Site Specific Risk Assessments analyzed for as an isopropylamine salt, Triclopyr as a butoxyethyl ester, and a blend of vegetable oil and silicone-based surfactants as the surfactant. SERA 2003, and 2007 Risk Assessments used to develop the Site Specific Risk Assessments are based upon multiple chemical formulations. Specific tests and risk analysis are based on glyphosate and triclopyr BEE not on the Accord or Garlon 4 Ultra trade name products, while risk assessments for Syl-tac are based on the product. References to Accord or equivalent, Garlon 4 Ultra or equivalent, and Syl-tac or equivalent are in reference to the product trade name not the chemical formulation. No products equivalent to the specific registered brand names have been identified as equivalent to the specific product at this time, however, it is not the intention of the Forest Service to limit competition with this project and if a product with the same formulation was identified.

Comment 2: The DEIS needs to include specific parameters that are well described, site specific and analyzed for proposed herbicide use. How many herbicide applications are planned under alternative 1? What species of brush and perennial plants are targeted? What noxious weeds will be sprayed? What specific chemical formulation will be used? (1)

An open-ended statement that is particularly disturbing is found on page 17. "Follow-up treatment of herbicides would occur 1-5 years after the initial treatment of herbicide in three situations.
• where plants targeted in the initial herbicide treatment are difficult to control and may need follow-up treatment with **the same herbicide or a different herbicide to achieve adequate results** (less than 30% cover of brush for at least 10 years for natural brush species and 0% for noxious weeds);"

The statement "or a different herbicide" is a red flag and demonstrates the lack of clear analysis and set parameters in the DEIS. All proposed herbicide use must be fully disclosed to the public and the decision maker.

Response: *Two herbicides and associated adjuvants, and the maximum quantity of each that would be applied per acre were identified in Table 4 of the DEIS on page 26. The criteria for treatment and retreatment is described on page 16 and 17 of the DEIS. Type of herbicide proposed for each treatment unit and target plant species are identified in Appendix A, Table A-2. Herbicide application in units 318-*

17 and 329-15 have been added to table A-2 and A-4 to account for noxious weed species and maximum number of acres to be treated for noxious weeds within the identified treatment units in the Final EIS.

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in expansion of noxious weed populations as a result of Project Activities. Noxious weed expansion that is expected to continue along the Eleven Pines Road, and in the northwest corner of the project area are unrelated to project activities, and therefore are not addressed in this document.

Comment 5: Missing from this discussion is a complete list of the factors that caused invasions of scotch broom, skeleton weed and others. Without knowing what led to past noxious weed infestations how can the Forest Service effectively prevent re-infestation? The Forest Service fails to include in this DEIS a true integrated weed management plan that would include limiting and reducing activities that have led to past invasions. The Forest failed to include analysis of the impacts of: logging, off-road activities, and excessive road construction that facilitate noxious weed dispersal. Disturbances that have led to past and will lead to future noxious weed infestations must be dealt with as part of this plan. The Forest Service needs to include in the EIS their plan for treating disturbance-causing activities that lead to noxious weed infestations within Eldorado National Forest. (1)

Response: *Existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. The Biological Evaluation for Sensitive Plants and Noxious Weed Risk Assessment for the Proposed Big Grizzly Fuels Reduction and Forest Health Project identifies the presence of noxious weeds within the project area, vulnerability of habitat within the project area to the spread of noxious weeds, vectors unrelated to the proposed project, habitat alteration expected as a result of the project, increased vectors as a result of the proposed project, mitigation measures, and anticipated weed response to action alternatives. The effects analysis for Botanical Resources in Chapter 3 of the DEIS on pages 83-89 summarizes potential direct, indirect, and cumulative effects of project activities on noxious weeds in the project area from this Biological Evaluation. This information is on pages 91-95 of the Final EIS.*

Design criteria developed for the Big Grizzly project includes limiting and reducing activities that have been identified to increase the risk for noxious weed spread due to project activities. These measures include equipment washing clauses for contracts, use of weed free straw and gravel, avoidance of known populations of noxious weeds, and treatment of known populations within treatment units in addition to other measures described in the Design Criteria of the Draft and Final EIS.

Comment 6: This DEIS also states that surveys of the proposed treatment area have few known populations of noxious weeds other than small areas of scotch broom and rush skeleton weed. Yet the plan repeatedly proposed that herbicides be used for noxious weed management. How does the Forest Service know that herbicides are the most appropriate management tool for these future noxious weeds without knowing the identity or extent of invasion? If monitoring is done and new populations are found in the project area, small, new infestations are relatively easy to control with manual methods. Why have manual, biological, grazing or other non-chemical invasive plant management strategies not been addressed? This is a large gap in the current DEIS that requires further discussion. (1)

Response: *Page 24 of the DEIS described the proposal for multiple treatment methods to deal with any identified new or expanding population of List A noxious weed species that result from project activities and are identified through monitoring. Manual treatments including lopping and pulling are included in the Proposed Action. Specifically page 24 described that: "New occurrences of List A noxious weed species would be treated by hand pulling (spring-summer before seed formation except rush skeleton weed), lopping in the late summer/early fall, or with herbicide treatment." High potentials for rush skeleton weed infestations to expand from pulling after 1-2 years limit potential for hand treatment methods for that species, and therefore hand treatment methods of that species have been excluded from this proposal. Herbicide formulations to treat rush skeleton weed were omitted from the Design Criteria and the effects analysis and are not included in this project.*

Preventive measures are expected to minimize the expansion of rush skeletonweed into and within treatment units. If treatment needs are identified for rush skeleton weed in the future, activities would

be analyzed at that time. Scotch broom is the only noxious weed that has been identified for treatment. If hand treatment is not feasible or successful at controlling expanding scotch broom in units 329-15 and 318-17, use of glyphosate in the identified treatment units has been proposed as a control measure page 17 of the Final EIS, and is analyzed for in the Draft and Final EIS.

Comment 7: CATs also found the description of the application methods for all alternatives that include herbicide use to be vague and contradictory. Page 25 reads: "Herbicide application would be restricted to ground based application. Backpack sprayers with no boom would be used to apply spray in sweeping motions. The spray would be applied directly to targeted plants...". The use of the term "sweeping motions" does not lend confidence to the following statement that "spray would be applied directly to targeted plants". Further description of the application method would lend clarity on this subject and also help determine the potential for environmental impacts. Quantity and application rate greatly alter potential environmental impact. The statement on page 25 also seems to be the only place in the DEIS, other than the BMPs that discuss the herbicide application methods. (1)

Response: *With the application method proposed, the herbicide is released through a handheld wand with a trigger that is controlled by the applicator. This allows the applicator to apply the herbicide over the target plant by moving their arm in a motion that covers the plant then to release the trigger, stopping spray emission before moving on to the next target plant. BMP 5.13 in Appendix B of the DEIS specified the requirements of these herbicide application tools. This information has been moved to Chapter 2 of the Final EIS to for clarification. Table 4 in Chapter 2 of the Draft EIS and the Final EIS describes the maximum quantity of herbicide that would be applied per acre.*

Comment 8: The BMPs state that herbicide spray will be kept within 24 inches of target plants. This is contradictory to the statement that spray will be applied directly to target plants. 2 feet is a wide margin of error that could greatly impact non-target organisms and soil health. The herbicide application evaluation in the DEIS is not acceptable. (1)

Response: *The criteria to keep spray nozzles within 24 inches of target plants is meant to describe the maximum height the spray nozzle should be from the target plant not the horizontal distance that would be acceptable, therefore we disagree that this statement is contradictory to the statement that spray would be applied directly to targeted plants. Due to concerns raised by the commenter the description of the 24 inch distance has been in the Final EIS on page 28.*

Comment 9: The DEIS completely dismisses the possibility of drift from the herbicide spraying by stating that spay will only be applied to target plants. Whenever herbicides are sprayed the possibility of drift to non-target species, soils, and water sources are present. Winds and various weather conditions can increase the likelihood of herbicides effecting non-target species and soils. Even using wick applicators does not prevent non-target plants and soils from being impacted. All these impacts must be weighed and considered as costs and negative adverse impacts associated with herbicide treatment methods. (1)

Response: *The Design Criteria for the Big Grizzly project were developed to reduce the risk of drift during project implementation. We agree that various weather conditions can increase the risk of herbicides having an effect on non-target species and soil, and therefore included criteria that limit application to weather conditions that minimize those risks. The risk of drift however, is not dismissed by stating that herbicide would only be applied to target plants. The effects analysis for individual resources in the Big Grizzly project record developed from the project specific risk assessments and summarized in Chapter 3 of the Draft and Final EIS includes discussions on the potential for drift to cause effects for each resource.*

Comment 10: The Aquatic Wildlife Effects section for Alternative 1 in the DEIS states in several location that there is not data on effects of the proposed herbicide applications. For example, page 109: "SPORAX - Very little information is available on the effects of borax to amphibians." This and other examples in the

DEIS show that the Forest Service does not have sufficient data to analyze the potential environmental effects of the proposed project. How will the Forest Service rectify these gaps in critical data? It is perplexing to think that the Forest Service proposes to use chemicals on public lands that are little understood or rarely studied. Page 109 states: "[s]tandard chronic exposure studies on the effects of borax and boric acid in fish were not identified in the literature; all of the available data are from a single study on the effects of borax on rainbow trout, channel catfish, and goldfish." This information was gathered in 1977 and needs to be updated. More information regarding effects of borax and boric acid must be considered. (1)

Response*: It is typical with various pesticides that amphibian studies are lacking, therefore surrogate studies such as with fish or invertebrates are used and the results are conservatively applied. With most pesticides, the hazard quotients for fish and amphibians are fairly similar, and using the sensitive fish or invertebrate hazard quotients can be similar to amphibians.*

For Borax we have information on 5 amphibians: larval leopard frogs, wood frog, Jefferson salamander, spotted salamander, and American toad. The wood frog, Jefferson salamander, spotted salamander and American toad study took place in 1998 (Laposata and Dunson 1998). Results of the study show that boron concentrations of 50 and 100 mg Boron/L caused a dose-related decrease in proportion of eggs hatching in American toad, while hatching was unaffected in the other three species (Laposata and Dunson 1998). In this same study, a dose-dependent increase in proportion of deformed larvae was observed in wood frog, Jefferson salamander, and spotted salamander (not assessed in American toad).

The TES amphibians with potential habitat in the Big Grizzly Project area are foothill yellow-legged frog and California red-legged frog. Foothill yellow-legged frogs do not travel away from water, so it is not possible that they would be exposed to the salts of Borax near stumps using the stream buffer as implemented. California red-legged frog habitat would be buffered from harvesting and application of Sporax, therefore it is believed that project activities will not adversely affect this species.

The only other two amphibians in the area are the Sierra newt (Taricha torosa) and Sierra Nevada salamander (Ensatina eschscholtzii). The Sierra Nevada salamander resides under bark, is associated with coarse woody debris, and may live next to stumps. It is possible that the salts applied to the tops of stumps may end up around bark on the ground next to these stumps after a rainfall. Sierra newts leave aquatic habitat within a few weeks of breeding, and aestivate terrestrially during the dry summer. Mesic microclimates, such as deep leaf litter and animal burrows, are used as aestivation sites, and some individuals migrate considerable distances to them. During this traveling they could come into contact with the Borax salts if they become washed off the stump during a rainfall. Both of these scenarios are possible but not likely, as borax is applied strictly to the tops of the stumps, and application is restricted during periods of predicted rain. Since the substance lasts for over a year on the stump and is washed with rainfall, it is possible that areas around and below the stump may contain diluted Borax salts, which could potentially affect a few individual salamanders.

Comment 11: Chapter 3 states "It is assumed that the thick skin of the western pond turtle would cause contamination from skin exposure to herbicides to be less likely." This presumption needs to be supported by sound science. Have studies concluded that the pond turtle's skin would actually protect it from herbicide exposure? If not, then more analysis needs to be undertaken. Chapter 3 also states that "None of the mapped western pond turtle nesting habitat locations are proposed to be sprayed with herbicides; however, if herbicides were to reach western pond turtle eggs underground, potential effects to treated eggs are unknown." If pond turtle eggs may come in contact with herbicides, the effects need to be studied before any action is taken. If it is not feasible to make needed studies to fill data gaps for significant potential effects, the reasons must be given in the EIS. (1)

Response: *None of the pesticides being proposed have been in the literature as adversely affecting reptiles. Atrazine, acetylcholinesterase-inhibiting pesticides (such as carbaryl) and PCB's are the*

primary pesticides studied that have effects to reptiles (Bergeron et al. 1994, Suzawa and Ingraham 2008, DuRant et al. 2007). Carbaryl and PCB have much higher propensity to accumulate in the fatty tissues than the herbicides proposed in this document.

As mentioned above, surrogate species are used conservatively when studies have not been performed on pesticide effects to species. Using the fish or amphibian studies for western pond turtle should be protective when in an aquatic habitat. For terrestrial habitat, effects to small mammals are used. The following is an analysis of effects to western pond turtles walking on land through vegetation sprayed with herbicides during overland movements. Based on the natural history of the western pond turtle, there is a risk for exposure of pesticides to western pond turtles or their nests at practically any time of year that spraying may occur. Western pond turtles moving on land, as well as their nests, could be exposed to herbicide through direct spray, or from contact with contaminated vegetation. For the direct spray and contaminated vegetation scenarios, a small mammal is used as a surrogate species (Table 1 below). The 100% direct spray analysis is used as a worst case scenario (SERA 2003a,b). For glyphosate and triclopyr, these scenarios yielded a hazard quotient less than 1, below the level of concern. Since Borax is not a spray, the direct consumption analysis was used; this hazard quotient was also below 1 and below the level of concern (USDA 2006). It is unlikely that 100% of herbicide spray would be absorbed through the skin as western pond turtle skin is not as permeable as amphibians, and they have a hard shell over a majority of their bodies. The likelihood of a turtle being sprayed is very small, as no western pond turtles have been observed in the project area, and it is likely that an applicator would see a western pond turtle before being sprayed. Somewhat more likely, a western pond turtle could travel through an area that was recently sprayed and make contact with the herbicide on its tough skin. The absorbed dose resulting from contact with contaminated vegetation is assumed to be 1/10 that associated with comparable direct spray scenarios. Thus, hazard quotients associated with contact with contaminated vegetation would be less than the direct spray scenario.

Table 1. The highest potential hazard quotient for western pond turtle (from the small mammal analysis) assumes that 100% of the spray is absorbed through the skin during overland movements.

Herbicide	**Hazard Quotient for accidental acute exposure of direct spray***
Glyphosate	0.6
Triclopyr	0.58
Sporax	0.0023 (for direct consumption as it isn't a spray)

*From SERA Risk Assessment Worksheets and from Table 27 in Terrestrial Wildlife Biological Evaluation.

There is a potential for herbicides to be in contact with western pond turtle nests, although the possibility of this occurring is unusual. Nests are 7-12 cm below the surface, and eggs are hard shelled (Ernst and Lovich 2009). According to the USFS soil scientist, at this depth it is expected that herbicides would only reach the nest underground if there was a heavy rainfall after spraying, saturating the soil resulting with deeper infiltration (Nicita, personal comm. 2010). The only studies on eggs being exposed to chemicals refer to chemicals within eggs as a result of food being eaten by the female laying the eggs. None of these chemicals within the female were the pesticides the Forest Service is proposing. Other studies describe endocrine effects on hatchlings caused by pesticides organochlorine, chlordane, trans -Nonachlor, or p,p'-DDE, which are not being proposed in this project (Willingham 2001, Aguirre et al. 1994). The pesticides proposed in this project are not known to cause interference with endocrine hormones on any species.

This information was added to the analysis for effects to western pond turtle on pages 115-116 of the Final EIS.

Comment 12: The insufficient description and analysis throughout the DEIS for the proposed use of herbicides skews the analysis to support Alternative 1, the proposed plan. The Forest Service repeatedly throughout the DEIS provides an inadequate description of the alternative 3, the no-spray alternative. By doing so, the Forest service skews the analysis to improperly support its conclusion. NEPA requires that the alternatives be objectively evaluated. The Forest Service also fails to provide a reasonable range of alternatives. The Forest needs to address the DEIS's lack of a reasonable range of alternatives. Alternatives 1 and 3 are the same; just Alternative 3 is without herbicide use. Why is there only one no pesticide use alternative? Why aren't several different approaches and techniques evaluated in an integrated vegetation management (IVM) alternative? The lone no pesticide alternative is never given a fair evaluation. All alternatives need to be objectively evaluated, without the biased presentation given in the DEIS. (1)

Response: *Comments received during scoping regarding potential impacts to human and animal health from use of glyphosate proposed with this project were identified as a significant issue and therefore a no herbicide alternative was developed. However, the majority of activities included in the Big Grizzly project do not include herbicide application. Of the approximately 5,800 acres proposed for treatment with this project approximately 1/5th, less than 1200 acres is proposed for any treatment using herbicides. Therefore there is no reason to change the method proposed to treat 80% of the acres based on significant issues related to herbicide use, therefore any "No Herbicide Alternative" developed to address the issues of herbicide use would be characterized as the same as Alternative 1 without herbicide use for the majority of the project treatments. We do not believe that the presentation that there is not a need to change the majority of treatments in the project to implement the project without the use of herbicides biases the presentation of this alternative, but rather that it is the clearest way to describe the difference between the alternatives. However, based on concerns raised in this comment the description of Alternative 3 has been further clarified in the Final EIS.*

It is true that numerous scenarios could be developed that would implement the project without herbicide, including not treating these units at all. For the development of Alternative 3 the scenario that has proven on the Forest to be the most feasible to implement and effective at meeting the stated Purpose and Need of the Big Grizzly project without using herbicide was analyzed (i.e. a follow-up mastication treatment in plantation stands and hand grubbing in planted gaps) allowing for a fair comparison of the benefits and effects of treatment without using herbicides. Not treating these units another scenario that would address the significant issues related to herbicide use. These effects are included in the analysis of Alternative 2. Additionally, a separate alternative using prescribed fire rather than herbicide was developed, although this alternative was not analyzed in detail. Therefore we believe a reasonable range of alternatives to implement the project without using herbicide has been analyzed.

Comment 13: Studies show Borax may not be as effective as believed. The US Forest Service has for many years touted borax as highly effective and the only solution for preventing the spread of *Heterobasidion annosum* and annosus root rot disease. While the Forest Service has been liberally applying borax throughout our public forestlands, there is some question as to whether or not it is as effective as believed (or even needed).

In a study review of research on annosus root rot disease, US Forest Service Region 5 scientist R.S. Smith Jr. reported, "there is continuing concern that annosus can infect stumps via the roots rather than just through the stump surface, and that borax treatment may not be fully successful in preventing the disease" (1989).

An even more interesting study was done by Region 5 Forest Service scientists, which reviewed the efficacy of borax stump treatment in protecting trees from annosus root disease. The authors reported "borax may be ineffective because it washes off stumps and that high stump densities in precommercial thinnings make it difficult to apply. Evaluation done twenty years after precommercial thinning revealed that plots with borax treated stumps did not have significantly lower annosus infection than did untreated

stands" (Edmonds at al. 1989). (1)

develop non-toxic, non-borax treatment methods for protecting our forests. This is of concern since other parts of the US and other countries (Canada, UK) effectively use non-borax prevention alternatives. In California the Forest Service has been applying vast quantities of borax as part of many forest health and fuel reduction projects, avoiding necessary public review, alternative evaluation and environmental effects analysis as required by the National Environmental Policy Act (NEPA) by using Categorical Exemptions (CEs) under new Forest Service directives released by the Bush Administration.

Logging has been shown by multiple studies to increase annosus root disease occurrence in western forests for a number of conifer species. The disease typically appears in stands several years after logging and is associated with stumps and logging wounds in remaining trees (Smith 1989).

The incidence of annosus root disease increases as logging increases for true fir and ponderosa pine stands. Logged stands have a higher occurrence of the disease than unentered stands, and stands with a history of multiple entries have the greatest rate of infection (Goheen and Goheen 1989).

Precommercial thinning is common in California's public forests. Yet, studies have shown it to increase the incidence of annosus root disease. Chavez et al. (1980) found that western hemlock tree infections increased greatly after precommercial thinning. Also thinning actions provide fresh stump sources and wounds to live trees from logging equipment, which can become infection courts for airborne annosus spores, and do contribute to higher rates of infection in thinned stands (Edmonds et al. 1989). In a true fir stand that had been logged five to ten years earlier, annosus root disease was found on 89% of the stumps (Filip et al. 1992).

It seems obvious that logging, and in particular precommercial thinning timber operations, are responsible for the rapid spread of Heterobasidion annosum. Under the Bush administration our national forestland managers have had the option to increase logging in the name of fuels reduction and forest health. Less logging means less annosus root rot disease, and appears to be an essential step for protecting the trees in our national forests and reducing the Forest Service's dependence on borax. While this may affect the Forest Service's love-fest with commercial timber operators, it would be the best way to preserve biodiversity in our public forestlands. The Forest Service could be conducting fuels and vegetation management using prescribed burns, goats and other less intrusive methods.

Experts agree that changes to current thinning activities are necessary to control *Heterobasidion annosum*. Reducing the number of thinning operations by planting trees at wider spacings is recommended (Ammon and Patel 2000). It is also recommended to carry out thinning operations carefully to reduce incidence of tree wounds and thin only when reproductive basidiospore populations in the air are lowest (cold winter in the north, hot dry summer months in the south) (Schmitt et al. 2000; Ammon and Patel 2000; Flip and Morrison 1998). Removing injured trees in high-risk areas can also be effective (Schmitt et al. 2000).

In a study of coastal British Columbia precommercial thinnings, it was suggested that the increase of H. annosum infection can be minimized by thinning before age 15, by cutting only trees less than 10 cm in diameter and by thinning during low risk seasons (Morrison and Johnson 1999).

The Forest Service should be requiring logging techniques that minimize accidental thinning wounds. This pesky pathogen can be eradicated or reduced by a couple of simple pre and post harvest techniques. One is using prescribed burns. Two pre-thin burns (one at least six months before thinning) and one or more post-thin burns will destroy reproductive basidiocarps and eliminate litter and other favorable annosus habitat and basidiocarp development environments (Ammon and Patel 2000, Flip and Morrison 1998). Prescribed fires can also start to return the forest to pre-historical natural conditions. The second annosus eradication and reduction method is simply mechanically removing and burning stumps and attached roots in infested sites (Ammon and Patel 2000). This control method seems like common sense and should be incorporated by the Forest Service. The Forest Service should also be wary of overusing its magic bullet. The use of Sporax in already infested stands may worsen the problem by preventing natural

annosus competitors from entering stumps (Ammon and Patel 2000).

Phlebiopsis gigantea, an aggressive, highly competitive fungus is recommended as a borax alternative, as it colonizes stumps to the exclusion of the annosum root rot fungus (Annesi et al. 2005; Pratt et al. 2000; Ammon and Patel 2000; Pratt 1999; Flip and Morrison 1998; Rishbeth 1963). *Phlebiopsis gigantea* is incapable of causing disease in standing trees and is not regarded as hazardous to human health (Pratt 1999). It has been utilized as a biological control agent for annosum root rot for approximately 40 years in Europe (Pratt et al. 2000). Canadian scientists have been testing P. gigantea for the same purposes and have been getting good results (Laflamme). In the southeast part of the US it has been shown that *P. gigantea* is completely effective in preventing stump colonization by H. annosum, with a cost only slightly more than that of borax (Flip and Morrison 1998).

This raises the question as to why we are not using this non-toxic protection method here in California? Unfortunately it appears as though CATs has done more research on Phlebiopsis gigantea and other Annosus disease spread prevention methods than Region 5 of the Forest Service. *Streptomyces griseologalbus*, an actinomycete isolated from the rhizoplane of the nitrogen-fixing nodules of a common California native, has been identified as a strong antagonist of annosus, and a possible biological control in the Pacific Northwest (Rose et al. 1980). (1)

Response: *The analysis of the use of pesticides, under NEPA, is no different than the analysis of any other action. CATs' statement that the proposed use of pesticides requires us to develop alternatives to avoid or minimize environmental impacts is not correct. Alternatives should be developed in response to significant issues, and meet the purpose and need, regardless of what type of project is being proposed. No project specific issues were identified with the use of Sporax that would have required the development of additional alternatives to the Proposed Action. There are however alternatives within the range of alternatives analyzed that do not contain the use of Sporax as part of the proposal. These include the No Action Alternative, the Non-commercial Alternative, and the Hand Thinning and Prescribed Fire Alternative. The No Action Alternative considers the alternative of not cutting trees.*

It is important to note that in Chavez et al (1980), the authors state that "the highly significant increase of infection by H. annosum in remaining trees is mostly attributable to the untreated stumps left from the precommercial thinning". Kliejunas (1989) cites studies showing that in eastside pine that annosus incidence was greatly reduced in boraxed stands vs. non-boraxed stands. Logging in areas that are susceptible to annosus will result in increased levels of annosus if stumps are not treated.

Careful logging is always a good idea in partial cut stands. It has been demonstrated, especially in white fir, that logging damage provides points of entry for H. annosum. Design criteria have been put in place to reduce residual damage including marking trees to be removed, using identified skid trails and landings, use of bumper trees during logging as identified by the sale administrator, limiting log length, using directional felling and the use of feller/bunchers.

The quotation from Morrison and Johnson (1999) is from the abstract. The sentence just before that quote is "Colonization of precommercial thinning stumps by H. annosum occurs throughout the coastal region of British Columbia, and this will increase the incidence of butt rot" [underlining added]. This study is based on precommercial thinnings in stands up to 8" in diameter in the coastal zone of British Columbia (Douglas fir, western hemlock, amabilis fir, and Sitka spruce). Their conclusion about 10 cm is not entirely supported by the data, as the relationship between dbh and percent of surface area colonized is linear, and in the case of all but the amabilis fir, is not very steep (increasing stump diameter increases percent infected, but not by much). Age at time of thinning and season of thinning were not significant variables for percent of infection, although the data showed a response. This study, focusing on small diameter stems, cannot be used to justify a decision to limit the upper diameter of harvested trees. The fact that small stems are less likely to be affected by annosum root disease is already incorporated into our Regional direction on the use of Sporax (USDA Forest Service 1994a). In Filip et al (1992), the results showed that the rate of infection of untreated true fir stumps 5-10 years

after cutting was not related to stump diameter in the range sampled (12 to 23 inches+).

Cutting when annosus spores are lowest has been suggested, but there are no data or studies to support the efficacy of such a treatment in California. Morrison and Johnson (1999) determined there was no significant difference in season of cutting in coastal British Columbia. Schmitt et al (2000) state that restricting cutting to summer months may reduce potential of stump and wound colonization, but give no data to evaluate, nor do they state that this would eliminate the need for Sporax. Ammon and Patel (2000) recommend thinning during dry, hot months in the SE US or during winter months in the NE US, but also give no data to evaluate, nor do they state that this would eliminate the need to treat the stumps otherwise. Phelps et al (undated) demonstrated that in the SE US, summer thinning only slightly reduced infection over controls and that borax treatment was much more effective. Filip and Morrison (1998) and Stambaugh (1989) report that cutting in the summer (April thru August) in the SE US, south of latitude 34°N appears to reduce losses caused by annosus root disease. Filip and Morrison (1998) state that seasonal logging has not been demonstrated in the interior west to be effective. In Russell et al (1973), monthly spore patterns in Washington and Oregon peaked in the fall, with a lesser peak in the spring, but airborne spores were present in large numbers nearly year-round. In James and Cobb (1984), spores are produced in the Stanislaus and San Bernardino National Forests throughout the year. In their summary, Filip and Morrison (1998) state that although many materials have been tested, in the western US only borax is recommended and used operationally. Based on the data in James and Cobb (1984) and Russell et al (1973), it is likely that in the relatively mild climate of California where spores are produced throughout the year, restricting logging to a certain season would not be effective in reducing annosus root disease infection.

It appears that a study by Froelich et al, (1978) is the basis for the particular recommendations on using prescribed fire. In this study, underburns were set in 10-24 year old loblolly and slash pine plantations in the southeast US. Two pre-harvest burn prescriptions were tested: a fall burn, about a year before thinning, followed by either a late summer/early fall burn about a month before thinning, or a winter burn about 9 months before thinning. Post-thinning fires were in the winter. Results showed that in most plots, there was a reduction in infected trees as a result of burning. Many plots still showed substantial infection levels after burning, although lower than the controls.

Ammon and Patel (2000) and USDA Forest Service (1977) recommend the particular sequence of burning as tested in Froelich et al (1978), but they don't state that this would eliminate the need to treat the stumps otherwise. Filip and Morrison (1998) reference the study by Froelich et al (1978) yet they make no mention of prescribed fire for annosus disease prevention anywhere else in North America. Otrosina et al (2002) found no significant difference in annosus levels in a 40-year old longleaf pine plantation underburned during the winter. Schmitt et al (2000) recommends prescribed burning as a treatment to reduce white fir in mixed conifer stands that naturally would have been dominated by ponderosa pine, but say nothing about prescribed burning as a prevention treatment for annosus root disease.

There is no literature supporting prescribed burning as a control of annosus in California ecosystems. In the Western US, annosus conks are most often found inside stumps or under the bark. In the Southeast US, where the burning method was developed, conks are formed in the duff at the base of trees and could be killed by prescribed fire. Prescribed burning would not be feasible as a control method for annosus because of the need to destroy the stumps. In 1994, a field trial was attempted in which fire would be used to destroy infected stumps (Pronos 1994). This trial was unsuccessful because the stumps were still too wet to burn, even three years after harvest.

Schmitt et al (2000) doesn't say Sporax treatments are not effective in areas where stumps are infected, but rather says that borate treatment of already-infected stumps is not effective (page 9). Schmitt et al also doesn't say that removal of stumps is the most effective treatment, and in fact states that minimizing site disturbance is a positive step to be taken. In Ammon and Patel (2000), it states that Sporax may aggravate the problem if applied to stump surfaces in already diseased plantations,

because Sporax will prevent natural competitors to annosus from establishing themselves on the treated stumps. They recommend using P. gigantea fungus within already infected sites. There is no definitive data that the use of Sporax exacerbates an annosum problem. This may occur when residual roots of cut trees are severely damaged and infection may occur thru the damaged roots. There is no experimental evidence of this theory mentioned in Ammon and Patel (2000) that originated in the SE US. On the other hand, one may apply the reasoning that saprophytic decomposing fungi would quickly colonize the distal, dead and dying roots of cut stumps and thus isolate infected tissue to small enclaves within roots. Again, there is no experimental evidence other than our knowledge of the competitive saprophytic capacity of H. annosum, which is quite low.

Removal of stumps and roots infected with H. annosum would reduce the amount of inoculum of the fungus on the site, and allow for earlier successful revegetation of the site with susceptible conifers. Stump removal as a suppressive method is being tested in several recreation sites, and its efficacy has not yet been demonstrated. Kliejunas et al (2005), and other references on stump removal, state that stump removal is expensive and disruptive to the site. Kliejunas et al states that "although direct control appears feasible in some situations, prevention remains the preferred and least costly method of annosus root disease management in recreation areas."

The use of Phlebiopsis gigantea as a biocontrol for annosus root disease has been known since the mid-1950's, based on experiments conducted in England on Scots pine and Corsican pine by John Rishbeth. This particular agent is not as consistent as borax; in Rishbeth (1963) and Rose et al (1980), there are discussions of how P. gigantea is not as effective on some conifer species, including western hemlock and Douglas fir. Work by Laflamme and others in red pine in Ottawa, Canada shows promising results (Roy et al 2003). There is experience with this fungus in Europe on Scots pine, Norway spruce, and Corsican pine (Annesi et al 2005; Pratt 1999; Pratt et al 2000), and it was recommended to and used by private forest landowners and the USDA Forest Service in the past in the SE US (USDA Forest Service 1977), but its use was discontinued when US EPA determined it needed to be registered (Cram, undated). That it is still showing up on cooperative extension websites such as Ammon and Patel (2000) is interesting, considering that its use would not be legal (it is noted that the use of borax is strongly supported in Ammon and Patel (2000), and is described as "inexpensive, effective, safe, and easy to apply"). Treating with P. gigantea is not feasible at this time as it is not registered as a biopesticide either with US EPA or California, and there are no efficacy data for California forest conditions. There are data suggesting that Phlebiopsis gigantea would not be efficacious in California because it is too dry in summer and fall (Rishbeth 1963; Blakeslee and Stambaugh, 1974).

Streptomyces griseoloalbus is not currently available for use (neither registered, nor marketed). The study by Rose et al (1980) involved western hemlock, and contained no quantitative data concer.7(for)ng the effectiveness of S. griseoloalbus as a preventive treatment on wood substrates. A follow-up study by Nelson and Li (1980) showed that although the S. griseoloalbus protected western hemlock stumps better than the controls (31% infected stumps vs. 75%), it wasn't as effective as borax (0% infected stumps). There is no efficacy data from California that supports its use. There is a currently registered biopesticide that is related to the S. griseoloalbus considered in Rose et al (1980) - Streptomyces griseoviridis Strain K61, commercially available as Mycostop. This product is registered for seed rot, root and stem rot, and wilt caused by various fungi in ornamentals and forest seedlings. It is not registered as a stump treatment for annosus root disease. It is unknown whether Mycostop would be effective against annosus root disease.

Either of these materials, P. gigantea or S. griseoloalbus, would be considered a biopesticide and would need both US EPA and California pesticide registration. This method of control may be feasible in the future if efficacy can be demonstrated in California and if they are registered as biopesticides by both US EPA and California. Until such time as both efficacy and registration are met, these two biological agents remain untenable options.

Furthermore, replanting with Annosus resistant species is recognized as a method to reduce impacts

from annosus root disease. From the R5 Supplement to FSH 3409.11 (Chapter 60)(USDA Forest Service 1994a): Species Conversion. Because of host specificity of H. annosum, favor the non-infected host species. In mixed conifer stands with infected true firs on the Big Grizzly project, the stands have been proposed for conversion to more pine dominated species compositions through gap expansion and planting.

Comment 15: The question here is one of quantity and appropriateness, as the Forest Service is applying large quantities of boron salt compounds throughout our public forestlands, usually without evaluating alternatives, and sometimes neglecting to consider potential human and environmental effects. Borax is toxic in large doses. According to the US Forest Service, the borax used in forestry is identical to the material sold as a household cleaning agent (Dost 1996). Should that ease our worries or raise them?

Studies have prompted concern that borax is a human reproductive toxin (USFS 1995). A borax feeding study resulted in blood and metabolism disorders, and effects to the testes, endocrine system, brain weight, and size ratios among various organs and glands (US EPA 1993). High dose levels of borax have been found to cause testicular effects and decrease body weights during chronic oncogenicity studies. During reproductive and developmental toxicity studies, maternal liver and kidney effects, decreased weight gain, and decreased fetal body weights were observed. At the highest dose levels, no offspring were produced in two of the studies as well as prenatal morality observed (US EPA 1993). After three generations were fed 1.03% borax, chronic toxicity was detected, as reproductive organs for both sexes were affected and fertility was reduced (USFS 1995).

The US Forest Service (1995) reports that studies indicate chronic exposure to borax may cause reproductive damage and infertility. In the US EPA's Toxicological Review of Boron and Compounds (2004) the developing fetus of mammals is considered one of the most sensitive targets. The other most sensitive target is the testes of males, and adverse effects include testicular degeneration (US EPA 2004; USFS 2003, Evaluation of Human and Ecological Risk For Borax Stump Treatments). (1)

Response: *While there is no requirement within NEPA or any FSH/FSM that would require a project-specific human health and safety or environmental pesticide-use risk assessment when using Sporax, toxicology information for Sporax and risk of exposure was included in the project specific risk assessments available in the Project Record. Potential effects are summarized for specific resources in Chapter 3 of the DEIS.*

General toxicological effects of boron exposures in mammals are described in US EPA (1993 and 2004) and USDA Forest Service (1995). We recognize that borax and boron are potential reproductive toxicants with specific potential effects on the testes. The symptoms that are described in the CATs letter are the potential effects from chronic over-exposure, which is not expected from the use of borax in a forested situation.

Comment 16: As of 1995, the US EPA had not required inhalation studies for borax, so little is known about acute inhalation toxicity, although chronic exposure to borax dust has caused workers to develop respiratory irritations (USFS 1995). In a study published in the British Journal of Industrial Medicine involving 629 borax factory workers, symptoms consistent with chronic bronchitis and acute respiratory irritation were related to borax exposure (Garabrant et al 1985).

The US EPA warns of the potential for dermal and inhalation exposure among applicators and people reentering treated areas (US EPA 1993). The Sporax material safety data sheet states that inhalation may cause slight nasal irritation (Wilbur-Ellis). (1)

Response: *Garabrant et al (1985) represented a confined industrial borax manufacturing facility. These findings are not directly relevant to forestry uses of Sporax because of the confined situation in the studies, but do show that inhalation exposure to borax is likely to result in respiratory irritation. As stated on page 54 of Dost et al (1996): "Inhalation of significant amounts during typical forestry*

application is highly unlikely. In an industrial setting, workers have been exposed over full time work schedules over extended periods with no evidence of effect other than transient upper respiratory irritation."

From US EPA (1993) comes the following summary statement: "Applicators and others in treatment areas may be exposed to boric acid and its sodium salts during or after application. However, there is no reasonable expectation that these pesticide uses may constitute a hazard or risk to people involved in, or near to, handling or application activities. Proper care and adhering to label directions and precautions should reduce exposure and any associated risk."

Comment 17: The US Forest Service (1995) admits that there is insufficient information available to determine the potential for adverse health effects for humans from contacting or consuming borax treated vegetation, water or animals. (1)

Response: *Exposure estimates for workers and the public are difficult to calculate because of the low likelihood that any non-applicator, vegetation, or animal will be dosed. Deer and cattle are not attracted to free borax, so it is unlikely that humans would be secondarily exposed through eating venison or beef. As stated on page 60 of Dost et al (1996) and referenced in the Terrestrial Wildlife BE for the project: "Measurement of herbs and foliage at distances up to 5 m from stump and at various times after application do not show differences from measurements prior to application...surface litter is also not altered". Water contamination of nearby streams is not expected.*

Comment 18: Borax does not naturally occur in forests and we wonder what impacts and potential risks its introduction may be inducing. Borax is generally active in soils and it remains unchanged in the soil for one year or more. High rainfall conditions can cause borax to leach rapidly and soil microorganisms do not break it down (USFS 1995). (1)

Borax is partially soluble in water (USFS 1995). The US Forest Service (1995) warns not to apply directly to water, or to areas where surface water is present and not to contaminate water when disposing of equipment wash waters or rinsate. While boron salts have been observed to occur naturally in most unpolluted waterways, some areas have boron occurring in concentrations shown to be toxic to plants (US EPA 1993).

Borax may be toxic to many essential soil microorganisms at high levels (USFS 1995) and thus may adversely affect nutrient cycling functions within the ecosystem. This could mean major long-term changes in forest biodiversity when borax is applied to between 40 and 60 stumps per acre after precommerical thinning timber operations. Borax is applied at a rate of approximately one pound per an acre (USFS 1993).

Response: *Effects of borax application on individual resources are included in the specialist reports for the project, available in the project record, and are summarized in chapter 3 of the DEIS, including effects to water quality, soils, sensitive plants, and terrestrial and aquatic wildlife. Criteria to minimize risks to water quality were included in the project design including stream buffers, creation of a project specific spill plan, and restrictions to application during rain.*

There is little data on effects of borates on non-target fungi. It is unlikely that application of Sporax on stumps would result in increases in boron or borates in the soil above background levels (Dost et al 1996). Therefore effects to soil fungi and other micro-organisms would not be expected. If spilled or mis-applied, localized effects could occur, however any effects would be restricted to a relatively small portion of the environment.

Comment 19: Borax's primary breakdown product in soils is boron. While boron is an essential nutrient for plants, high levels of borax will kill vegetation and thus it can be used as a nonselective herbicide (USFS 1995).

The Forest Service reports that in high concentrations borax is "lethal to plants." It is also known to bio-accumulate in plants (Phelps et al. undated). The Sporax label reinforces this concern as it states, "Borax carelessly spilled or applied to cropland or growing plants – including trees or shrubs – may kill or seriously retard plant growth" (Wilbur-Ellis).

The Forest Service's borax fact sheet (1995) warns "Borax may be a hazard to endangered plant species if it is applied to areas where they live" when applied as a forest fungicide on stumps. Also borax's noncrop herbicidal use may harm endangered or threatened plants. Therefore the US EPA is requiring three phytotoxicity studies (regarding seed germination, seedling emergence and vegetative vigor) to assess these risks (US EPA 1993).

Borax is used as an insecticide and "relatively high concentrations of boron compounds are toxic to insects, even when used in forests (USFS 1995). What kinds of impacts are all these borax applications in our forests having on beneficial insects and overall ecosystem health?

CATs wonders what kind of impacts borax is having on invasive plants and noxious weeds? Could borax be providing an additional disturbance and clearing space for weed proliferation? Is borax's fertilizing properties providing a more friendly soil medium for exotics than native plant species? (1)

Response: *It is recognized that boron is an essential nutrient in plants; however boron can also act as a herbicide. Apparently the difference in doses between boron's effectiveness as a nutrient and its effect as an herbicide are not very distinct, and vary from species to species. Agricultural use of boron as a foliar fertilizer or fungicide generally occurs in the range of 0.9 to 9 lbs/acre (borax equivalent) while as a soil fertilizer, borax would be applied at a rate of 9 to 18 lbs/acre (Travis et al, 2003, US Borax, 2005). Above an application rate of 20 pounds borax per acre, there are indications that borax would act as an herbicide (27 pounds per acre is recommended as a control of creeping Charlie (Glechoma hederacea) in turf grass in the Midwest (Lunsford, 1998)). Applied at very high rates (670 to 1,770 pounds borax per acre) it will act as a soil sterilant (WSSA, 2002, US EPA, 1993, Kimball et al, 1956). US EPA (1993) states that borax can be applied to treat Klamath weed at a rate of 3-4 pounds/100 square feet (equivalent to 1,300 to 1,700 pounds/acre).*

The average application of borax in Region 5 is 1 pound per acre while the heaviest application reported over the last five years was at 6 pounds per acre; 90% of the applications are at or below 2.5 pounds per acre. Admittedly there is little information on the levels of borax that result in negative plant effects, however, these rates of application are within the range used and recommended as foliar fertilizer applications on various agricultural crops and a factor of 10 times lower than recommended as a selective herbicide on turf grass. If Sporax was applied to foliage or the soil at the same rates as it is applied on the cut stump (1 pound/50 square feet), it would be applied in the range that would act as a soil sterilant (870 pounds per acre). The careful application onto the stump surface and the prompt cleanup of spillage is necessary to avoid effects to vegetation in close proximity to stumps. Because of the application method, it is not expected that plants would be routinely exposed to Sporax. As stated in Dost et al (1996), page 11, limited monitoring data does not indicate treatment-related increases in boron content of adjacent foliage, litter, or soil, after stump treatment.

Comment 20: Since we have found no studies investigating the impacts of borax on amphibians, CATs is concerned that this salt, which remains active for a year in soils, may be having major impacts on amphibian populations. Amphibians, while aquatic during reproductive and other times, also are terrestrial and travel across the land. Amphibians are especially sensitive to chemicals and are believed to be useful indicator species within forest ecosystems. What impact on amphibian populations is occurring from the current widespread application of borax in our public forests? (1)

Response: *See response to Comment #20. For Borax we have information on 5 amphibians from a study that took place in 1998 (Laposata and Dunson, 1998). Effects to aquatic wildlife are discussed in the Aquatic Species Biological Evaluation for the project, available in the project record, and*

summarized in Chapter 3 of the DEIS and on pages 111-118 of the Final EIS.

Comment 21: Stump treatment with borax is only recommended for sites with known annosus root disease potential and where cultural control is not viable (Schmitt et al. 2000). How much cultural control is occurring in our public forests? This is where the Forest Service should be focusing its energies and not just relying on borax as a magic fix-it solution. The Forest Service needs to analyze annosus disease prevention alternatives for all relevant projects. (1)

Response: *Rather than relying on borax as a "magic fix-it solution" the Eldorado National Forest has proposed borax application to reduce spread of the disease, while also including other preventative measures such as including design criteria that minimizes residual tree damage and working to reduce disease spread in the long term by encouraging a mixed species composition that reduces future widespread, uncharacteristic damage by Annosus root disease. Alternatives to borax application, and rational for why these alternatives are not proposed for implementation in the Big Grizzly project are discussed in response to comment 14.*

Comment 22: CATs wonders if the Forest Service uses borax only in areas with known occurrence of annosus or just whenever it is in the budget? Are there times when borax is used when responsible silviculture doesn't dictate it? The Forest Service must clarify annosus infection potential in publicly reviewable documents before considering borax for stump treatments. (1)

Response*: Presence of Annosus root disease and potential for spread of the disease was identified and analyzed as a concern by Region 5 Forest Health Protection specialists in Report No. SS09-02 dated January 12, 2008, specific to the Big Grizzly Project and identified in the Purpose and Need for the Big Grizzly Project. Based on recommendations in the Forest Health Protection report for controlling the spread of the disease during project activities, the inclusion of Sporax on cut conifer trees over 14" in stump diameter in mixed conifer stands was included in project design. The January 2009 initial scoping for the project contained information and references to this report. Specific criteria for Sporax application including quantities and acreages were disclosed in the DEIS released for public comment on February 5, 2010. By including Sporax application only where continued spread of Annosus root disease through the stands was identified as a concern, we believe that we are only applying Sporax where responsible silviculture dictates. Based on the economic analysis for the project, we believe that it is a difficult conjecture to make that the Eldorado National Forest is proposing borax application based on funding in the budget.*

Comment 23: CATs is concerned about incidences where borax may be spilled into adjacent stream systems at the staging areas. We are also concerned about accidents associated with mixing that may compromise the health of workers. At a minimum, the US Forest Service must develop safety protocols for mixing and staging areas. The protocols should include identification of areas suitable for staging and mixing that pose little threat to stream systems in the case of an accidental spill. Workers need to be sufficiently trained and experienced in safety procedures for mixing and transporting borax, as well as first-aid response, in the event of accidental contact or exposure. First aid materials must be readily available at all project sites, and include access to running water for flushing borax particles. (1)

Response: *Safety protocols for handling of borax, worker training, and spill and exposure contingencies have been built into the project design through implementation of BMPs. Borax application to stumps as proposed does not require mixing. BMP 5.10 includes provisions that "Any herbicide application contract would contain clauses that would minimize the chances of herbicide spills such as: designating routes of travel and mixing sites, minimizing herbicide mix in tanks while traveling between units, requiring a separate water truck from the batch truck, and if a spill occurs, outlining responses required by the contractor. Furthermore BMP 5.10 includes provisions that a spill plan (project file) would be developed for this project. It would be reviewed by all Forest Service personnel involved in the project, as well as by the contractor and the appropriate forest and district staff and line officers; A copy would be retained onsite during operations; and spill kits would be required in Forest*

Service and contractor vehicles on site and where contractor supplied pesticides are stored. Additionally all pesticide applications would adhere to all appropriate laws and regulations governing the use of pesticides as required by the US Environmental Protection Agency, the California Department of Pesticide Regulation (DPR), CalEPA regulations and safety regulations, and Forest Service Policy pertaining to pesticide use. This includes appropriate training of employees.

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WILDLIFE

Comment 24: The Big Grizzly DEIS failed to analyze the additional potential impacts from climate change on wildlife in the project area. It is commonly mentioned in the climate/forest literature discussions that the increases in temperature and possible drought periods and lower snow-pack leading to increase in the possible frequency and intensity of fire, insect outbreaks etc., but rarely is it mentioned that wildlife habitat quality, habitat connectivity and movement may also be significantly impacted by vegetation shifts, droughts, fire and other factors (Morh 2009). Due to increases in climate stressors the Big Grizzly DEIS should analyze the climate impacts on wildlife in this area of the Eldorado NF and do so in the context of the existing fragmentation and short-term impacts of the treatments in conjunction with other climate stressors. (3)

Response: *An analysis of the impacts on wildlife from climate change in conjunction with the Big Grizzly project, based on predictions for effects to vegetation and habitat within the Sierra Nevada, has been completed for both terrestrial and aquatic wildlife species. This information is included in the Final EIS and in the Aquatic and Terrestrial Wildlife BA/BEs for the project.*

While climate change is a threat to many of the sensitive species within the forest boundary, this project is unlikely to add to these threats due to the benefits of protection of current and future habitat, protection of connectivity, and increases in the resiliency of the current habitat. While habitat quality for some of the sensitive species is expected to decrease temporarily, the long-term benefits of increased stand resilience provided by the project are expected to provide buffers from some of the expected negative impacts of climate change; therefore, some of the immediate negative impacts to the sensitive species as a result of this project would not be additive to the impacts from climate change.

BLACK BACKED WOODPECKER

Comment 25: The DEIS and MIS Report fail to analyze adverse impacts of the Project on the Black-backed Woodpecker, which is the only MIS bellwether species for all wildlife species associated with snags in heavily burned forest. This habitat type is very ecologically important, and supports high levels of native biodiversity (Swanson et al. 2010). The Project would affect Black-backed Woodpeckers for two reasons. First, recent science shows that pre-fire logging, consistent with the type of mechanical (commercial) thinning proposed in this Project, substantially reduces habitat suitability for Black-backeds even if the affected area later burns in a wildland fire, likely due to reduced potential densities of large snags upon which the birds forage (Hutto 2008, Hutto and Hanson 2009). Second, the Project DEIS, p. 37, Table 8, shows that the Proposed Action would totally eliminate the potential for moderate or high severity fire (passive or active crown fire) in the thinned areas. Black-backeds depend upon areas burned at higher fire severities (Hutto 2008). The DEIS violates NEPA by failing to analyze impacts to the Black-backed Woodpecker. Further, the Project would threaten the viability of the Black-backed Woodpecker by further reducing potential habitat across the landscape, thus violating the forest plan's requirement to ensure viability. The Forest Service has not provided information showing the quantity and quality of habitat necessary to ensure viable populations of Black-backed Woodpeckers within the Sierra Nevada planning area, including the minimum viable population threshold and the minimum threshold amount of suitable habitat necessary to support minimum viable populations in the Sierra Nevada. Without this information, the Forest Service cannot ensure the viability of this species, in violation of the forest plan and NFMA. (2)

Response: *The Sierra Nevada Forests MIS Amendment (USDA Forest Service 2007) amended the analysis and direction of MIS for the Eldorado National Forest Land and Resource Management Plan (USDA Forest Service 1988). The ROD for the Sierra Nevada Forests MIS Amendment (p.14) states that "... every project record shall contain a discussion of the effects of the alternatives on the MIS habitat(s) that will be directly affected by the Forest Service action." MIS for the Sierra Nevada National Forests represent 10 major habitats and 2 ecosystem components (USDA Forest Service 2007). As shown in Table 1 of the Big Grizzly MIS report, the black-backed woodpecker is selected as a MIS to reflect the effects of land management activities upon medium and large snags in burned forest. There is no burned forest habitat in the project area. Since the project will not directly affect the ecosystem component of snags in burned forest, the black-backed woodpecker is not an appropriate MIS for the Big Grizzly project.*

The commenter is correct that modeling of post treatment conditions within proposed treatment units in the fuels report shows that fire severity is decreased and the probability of crown fire (moderate to high severity fire) will be very low following project implementation (Ebert 2009). These conditions are consistent with meeting the stated purpose and need of the project. However, the commenter is incorrect in stating that thinning would reduce the potential for high densities of large snags following a potential fire and that the project would totally eliminate the potential for high or moderate severity fire.

The commenter's reference to Hutto (2008) and Hutto and Hanson (2009) in regards to pre-fire logging reducing the potential densities of large snags is a broad overgeneralization. Hutto (2008) examined data from northern Idaho and Montana in which their categorization of light harvest was everything from evidence of a few stumps to moderate shelterwood cuts within the last one or two decades. While it is clear that they found more black-backed woodpeckers in pre-fire unharvested areas, it isn't clear that the types of harvest studied are similar to that being proposed in this project. On the top of page 1,833, Hutto (2008) states: "Whether forests that have been "restored" through nontraditional harvest methods still retain the characteristics needed by Black-backed Woodpeckers after they burn severely under extreme weather conditions is currently unknown." The final section in Hutto and Hanson (2009) discusses the importance of dense unburned old forests, which corresponds with the purpose of, and need for, the Big Grizzly project. Objectives for the Big Grizzly project include (1) reducing the risk that treated existing late seral forest stands would experience stand-replacing

effects in the event of a wildfire and (2) increasing the probability that treated early and mid-seral forest stands would develop into dense unburned old forest stands by reducing the risk that these stands would be lost to wildfire before they could reach maturity.

Important habitat components for black backed woodpecker would be protected in the understory thinning, including large trees (>30"dbh), canopy cover (>40%), large down logs, and large snags (>15 dbh). Despite this protection, the understory thinning and follow-up piling and burning would result in reductions in canopy cover, decrease in snags, and down woody debris within black-backed woodpecker habitat (see Wildlife General Effects Section, Wildlife BE, Funari, 2009). Harvest prescriptions would retain a minimum of 50% canopy cover in HRCA units and 40% canopy cover in units outside HRCAs retained primarily from the largest trees available before harvest. Therefore, treated stands would have canopy cover that would still be preferred habitat for black-backed woodpecker if burned as they have been found to select burned areas that had 40%-100% canopy cover prior to burning (as referenced in Hutto and Hansen 2009). "Russell et al. (2007) also found that 89% of black-backed nests were in areas where pre-fire canopy cover was 40-100%, while only 52% of non-nest random locations had 40-100% canopy cover. "Within such areas black-backed woodpeckers are positively associated with an increasing number and diameter of snags" (Hutto and Hansen 2009). In addition, the density of large tree densities is not expected to be greatly reduced in treated units as thinning would remove primarily smaller diameter trees (<20"dbh) (Walsh 2009, Silvicultural Report). Black-backed woodpeckers would continue to have large trees (>20" dbh), large downed logs and large snags for foraging and reproduction if stands within the units were burned. Therefore, if units were to burn in high severity they should have an adequate density of large trees that would become snags.

As the commenter noted, these late-seral characteristics will be decreased in units from their current number, and burn intensity is expected to decrease as a result of treatments. This could lead to fewer snags available within units. Therefore, while habitat might be suitable in these project units for black-backed woodpecker if severely burned, their quality or acreage to support large numbers may not be as high. While the potential for the creation of high quality black-backed woodpecker habitat within the units is reduced, it is not eliminated and could potentially occur if greater than 90th percentile weather conditions persisted during a fire event. Additionally, it is important to note that the potential creation of black-backed woodpecker habitat outside the units still remains high. Proposed treatments only occur on a portion of the project area. The current high density of large trees retained in owl and goshawk PACs and other untreated areas is still retained in 69% of the project area. As described in the Direct/Indirect Effects of Fire section of the EIS, "Alternative 1 affects approximately 31 percent of the National Forest System Land within the project area. The remaining 69 percent of the area would remain in its current condition with the ability to exhibit high severity fire condition on the landscape". In terms of habitat capability retained, 73% of black-backed woodpecker habitat in the project area in CWHR habitat types 4M, 4D, 5M, and 5D would still be available for potential black-backed woodpecker habitat if burned (Table1) and is still likely to burn at high severity.

Table 1. Black-Backed Woodpecker Habitat*: Proposed Treatment within unit and project area areas

Measure	***Alternative 2 No Action***	***Alternative 1 Proposed Action***	***Alternative 3***	***Alternative 4***	***Non Commercial Alternative***
Units	**3,831**	**3,831**	**3,828**	**3,068**	**3,831**
Project Area (Total Acres: 22,456 acres)	**14,336** (12,456 FS Acres)	**27%**	**27%**	**21%**	**27%**

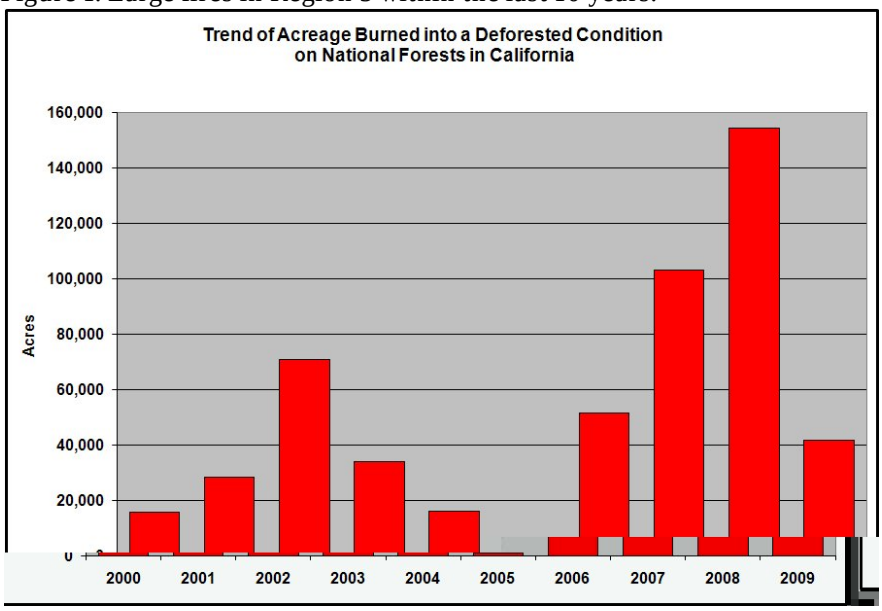
*Habitat Defined by CWHR Size and Density Types 4M,4D,5M,5D.

One of the Purpose and Need elements of this project is the strategic location of treatments in order to

modify landscape fire behavior. While the treatments give the Forest Service options for controlling a wildfire and slowing it down, that control is dependent on weather conditions, location of fire starts and fire personnel mobilized (as seen in the Fire Behavior modeling Ebert 2009). Areas of high stand density and high fuel loading located outside of the proposed treatment units would likely produce large areas of tree mortality from high fireline intensities and crown fire as fires burn through or around treated units. Several examples over the past several years have shown that fuels reduction treatments moderate fire behavior but do not inherently stop wildfires (Angora, Antelope, Rodeo, Black's Mountain, etc.) and large acres of high severity fire do occur in areas surrounding fuels treatments. Fites et al. (2007) showed that treatments located outside of high fuel loading areas did not affect the fire behavior inside the high fuel loading areas, except to slow down the advance of the fire. A similar outcome is evident in the FARSITE fire behavior simulations described in the Fuels Report (Ebert 2009). Within the project area, modeling of different ignition sources shows that treatments decrease moderate to high severity burned acres (e.g. crown fire activity reduced from 4,924 acres to 3,794 acres in Ignition 1). This decrease is a result of changing from crown fire to surface fire in the treated stand due to changes in vegetation structure and surface fuel loading. Approximately 20% less land is modeled to burn at moderate or high severity with treatments (Ebert 2009); but much of the untreated area in the simulated burn perimeter still burned with moderate to high severity fire. Therefore, even with treatment, patches of high severity fire are likely to occur within the project area because areas of high density that aren't treated still have the potential to burn with high severity. Potential for future wildfires to create patches of high severity fire that may provide high quality black-backed woodpecker habitat is not being eliminated from the project area. Also, treatment impacts within units are temporary and units would lose their resiliency against high intensity fire within the next 20 years as understory shrubs and trees re-grow and surface fuels accumulate, although this could be moderated by future management actions.

While acreages of theoretical future high severity burned forest habitat could be slightly reduced in the project area as a result of treatments in units, the potential to adversely impact black-backed woodpecker populations is low because black-backed woodpecker burned forest habitat is increasing in the region and its rangewide conservation status is apparently secure. The Global conservation status of the black-backed woodpecker is G5-Secure (common, widespread, and abundant) and the National conservation status is N4-Apparently Secure (uncommon, but not rare; some cause for long-term concern due to declines or other factor) (Nature Serve 2010). In addition, within Region 5, high severity burned forest acres have increased in the past decade and thus increased the amount of highly suitable black-backed woodpecker habitat (USDA 2010). Some of those burned areas have had post-fire salvage, which may have reduced habitat or lowered habitat quality. But general trends in the number of acres burned per year has generally increased over the last decade, with more large fires seen in California in the last 5 years then in the period of 5-10 years ago (Figure 1). Approximately 15% of this 10 years region-wide acreage was due to stand replacing fires.

Figure 1. Large fires in Region 5 within the last 10 years.



In addition, the average percent high severity acres burned on the Eldorado NF in the last 10 years is higher than the statewide average (Table 2).

Table 2. Large fires on Eldorado within the last 10 years

Fire	Forest	High Severity	Total Acres	% High Severity
Star Fire 2001	ENF/Tahoe	5,501	16,996	32
Fred's Fire 2004	ENF	2,749	7,471	37
Power Fire 2004	ENF	6,599	16,979	39
Ralston Fire 2006	ENF/Tahoe	403	8,593	5

It seems reasonable to assume that as a result of the 10 year region-wide increase in fire acreages, amount of large fires on the Eldorado, and the fact that the instance of stand replacing fire in the Sierra Nevada has been shown to be increasing (Miller et. al 2009), there has probably been an increase in the amounts of habitat creation for black-backed woodpeckers in burned forest of the Sierra Nevada over the last decade.

In conclusion, while acreages of high quality burned habitat may be reduced within the project area, it will not be eliminated and could still potentially occur. A high density of large snags could still occur within project units if high severity fire occurs within them and the further establishment of large snags will continue within the 69% of the project area left untreated. Additionally, with a stable range-wide conservation status, the increase of high severity burned habitat across the region and the greater than average high severity burned acres on the Eldorado NF, it is unlikely that the temporary decrease in potential high severity burned habitat in the project area would impact black-backed woodpecker populations.

HAIRY WOODPECKER

Comment 26: The DEIS, on p. 165, admits that future densities of large snags will be lower than they are currently under the Proposed Action, and that this will affect Hairy Woodpeckers (the MIS for large snags in green forest). However, the DEIS fails to provide any estimate of the future density of large snags under the Proposed Action, or analyze whether these future large snag densities would be sufficient for Hairy Woodpeckers.

The DEIS claims, on p. 166, that the Project would increase "snag levels" in mixed-conifer forest due to prescribed fire, implying that this would benefit Hairy Woodpeckers. However, the DEIS does not divulge whether LARGE snags would be increased by prescribed fire, or, more importantly, whether there would be a NET increase in LARGE snags in mixed-conifer forest under the combined effect of stand density reduction (which reduces future large snag recruitment) and prescribed fire. There is no excuse not to provide an estimate on this issue. The Forest Service has provided estimates of many variables in the DEIS based upon Forest Vegetation Simulator (FVS) modeling. What does FVS say about overall future large snag densities in ponderosa pine and mixed-conifer forests in the affected areas 10, 20, 30, and 40 years post-project? (2)

Response: *Using the Forest Vegetation Simulator, projections for future snags illustrate that the number of snags per acre greater than 18 inches in dbh are expected to slightly decrease for approximately 3 decades following project activities, but would remain more abundant than the desired minimum per acre. Trees between 16 and 18 inches in diameter are not captured with this analysis suggesting large snag averages are more likely slightly higher than those given in the output. After approximately 30 years the number of snag per acre greater than 18 inches are expected to increase as trees continue to age and die, although at a lesser rate than with no project activities since stand structure is expected to be healthier in terms of individual tree vigor and therefore more sustainable over time. FVS projections for the number of snags per acre with No Action shows that the number of snags per acre greater than 18" dbh is expected to continue to increase over the time period modeled and therefore would continue to add to high fuel loading, increasing the threat to the stand from high severity wildfire. Additionally, modeling is believed to most likely under-predict the number of snags that will result over the next several decades as the models do not include parameters for the current drought and insect related mortality that has been increasing on the Georgetown Ranger District, and within the project area within the last year.*

The FVS modeling for the project does not show impacts to large snags with prescribed burning 7-10 years following initial treatment. Studies seem inconclusive in their findings of large snag densities following a combined thinning and prescribed burn treatment. However, combining the insights from studies with results from other treatment, and the FVS modeling, it is likely that large snag numbers will at least remain similar to FVS levels following thinning treatments.

The application of fire following thinning may result in loss of current large snags as well as in recruitment of killed or damaged live trees to the large snag class (large tree mortality)(Hessburg et al 2010). Thinning alone has been shown to either decrease large snag levels (Hessburg et al 2010) or have no significance difference (Stephens and Moghaddas 2005). Burning alone has been shown to increase large snag levels (>9"dbh, Saab et al 2006), with most of the literature suggesting small diameter snag increases. Estimating the net effect of these changes is difficult because of variations in tree age, size, fuel moisture levels, duff depth, and number/location of snags within the treatment areas. Few studies have been able to show significant impacts to large diameter snags following combined thinning and burning treatments. However, most studies show significant increases to smaller diameter snags after thinning and burning. A study done by Stephens and Moghaddas (2005) in Blodgett Forest within the boundary of the Georgetown Ranger District, following a combined thinning and burning treatment, observed no significant difference in density of snags (for all decay classes) greater than 6 inches dbh in thin/burn treatments when compared to control treatments. Another study, Innes et al (2006) observed an 11-13% decrease in large snags (>17"dbh) in thin/burn treatments, but this decrease was not significant. Both these studies suggest no net change of large snags would occur in our treatments units.

At the level of acceptable residual tree mortality from prescribed burning some large trees would most likely become snags, but whether their numbers are offset by larger snags being consumed by fire or becoming downed logs is unknown. Observation of previously treated units in both the Quintette and Smarty Jones projects on the Georgetown Ranger District following thinning and prescribed burning have confirmed that large snags are created during project activities, however no data is available from

previous treatments on the Eldorado National Forest to support any conclusion about net change in number of large snags within previous thin/burn treatments.

This information has been added to the Silviculture Report, the Terrestrial Wildlife BE, the MIS report and to the final EIS.

FVS Projected Snag Densities for No Action, Proposed Action, and Non-Commercial Alternatives within treatment units.			
	No Action	**Proposed Action**	**Non Commercial**
Year	**>=18"**	**>=18"**	**>=18"**
2008	6	6	5
2011	7	6	6
2015	8	6	5
2018	8	5	5
2028	8	5	5
2038	10	5	7
2048	12	6	10
2058	15	8	14
2068	18	12	18

FOX SPARROWS

Comment 27: The MIS Report (p. 45) and DEIS claim that the Fox Sparrow is stable in the Sierra Nevada, citing Breeding Bird Survey (BBS) data, and data from the Plumas and Lassen Study Report 2002-present (Sierra Nevada Research Center 2007). However, the BBS website states clearly that the Fox Sparrow has declined at a rate of nearly 1% per year since 1980, and the Plumas and Lassen Study report (SNRC 2007) concludes that Fox Sparrows are declining significantly. Your DEIS and MIS Report misrepresent the status of the Fox Sparrow. This is troubling in light of the fact that the MIS Report, on p. 42, states that the Project would eliminate 55% of the montane chaparral habitat in the Project area (Fox Sparrows depend upon montane chaparral). The DEIS (p. 45) provides no citations to studies concluding that Fox Sparrow populations are stable overall in the Sierra Nevada. (2)

Response: *All information for fox sparrow population status and trend was provided by the USDA Forest Service Region 5, in the Sierra Nevada Forests Bioregional Management Indicator Species (MIS) Report (2008). Data utilized in determining population status and trend is directed by the Final Environmental Impact Statement, Sierra Nevada Forests Management Indicator Species Amendment (2007). The 2008 report indicates, based on the available data required by the MIS Amendment FEIS, that populations are stable with some localized declines.*

The bioregional scale population monitoring strategy for the Fox Sparrow is distribution population monitoring. Distribution population monitoring tracks the changes in the distribution of fox sparrow at the Sierra Nevada scale by monitoring the changes in the presence of the species across a number of sample locations (USDA Forest Service 2007). Therefore, the MIS Report and DEIS make a conclusion about the status of the population distribution of Fox Sparrow in the Sierra Nevada. Specifically, the MIS Report and DEIS make the following conclusion, based on a number of cited studies and monitoring efforts (Burnett and Humple 2003, Burnett et al. 2005, Sierra Nevada Research Center 2007, California Partners in Flight website, Sauer et al. 2007): "These data indicate that fox sparrows continue to be present at these sample sites, and current data at the range-wide, California, and Sierra Nevada scales indicate that, although there may be localized declines in the population trend, the distribution of fox sparrow populations in the Sierra Nevada is stable."

The primary areas of natural chaparral on the Georgetown Ranger District are at lower elevations

outside of the project area. Removing/altering 47 acres of the montane chaparral habitat within the analysis area will cumulatively alter or remove 55% of montane chaparral habitat and 25% of shrubland habitat within the project area which would add to the declining trend within the project area. There are currently 132 acres of montane chaparral and 161 acres of mixed chaparral within the project boundary. Because of the minimal amount of montane chaparral in the project area it is unlikely that removal of 47 acres would impact fox sparrow population distribution across the region, as the project impacts less than 1% of this area.

CALIFORNIA SPOTTED OWL

Comment 28: The DEIS and Wildlife BE utterly fail to divulge or analyze the fact that recent research reveals that California spotted owls preferentially select unlogged high-severity fire patches for foraging, while selecting unburned or low-severity areas for roosting (Bond et al. 2009). High-severity patches enhance habitat (e.g., montane chaparral, large downed logs, snags) for the Spotted Owl's small mammal prey species (Bond et al. 2009). The DEIS and BE ignore this important new data and instead merely cite studies pertaining ONLY to UNBURNED forest. The most recent scientific evidence makes clear that Spotted Owls benefit from natural heterogeneity created by patches of high-severity fire—habitat that is not mimicked by logging. Because of this major omission, the analysis in the DEIS and BE with regard to Spotted Owls is fatally flawed under NEPA. (2)

Response*: This comment appears to be based upon a belief that the action alternatives would eliminate high severity fire from the project area. While reducing fuels within the proposed treatment units is expected to reduce the likelihood of high severity wildfire within the treatment units under 90th percentile weather conditions as described in Ebert (2009) and summarized in the Wildfire Behavior section of the Draft and Final EIS, it would not eliminate high severity wildfire or passive crown fire within areas that currently have heavy fuels in the untreated portions of the project area. Even within treated units, areas of heavier fuels and ladder fuels would remain in riparian areas and retention patches which could exhibit torching fire behavior under wildfire conditions.*

As described in the purpose and need for this project, this project is designed to mitigate the potential consequences from a large high severity wildfire in the project area, which could potentially affect suitable nesting habitat for many spotted owls in the project area. By implementing a pattern of treatments in strategic locations across the project area, future wildfires would be expected to burn with a mixture of severities more similar to what would be expected in mid-elevation Sierran mixed conifer fire regimes without a history of fire suppression. This would be more likely to provide a spatially and temporally heterogeneous post-fire landscape of burned and unburned areas that would provide for a diversity of fire severities and habitat types, including patches of snags and regenerating shrubs that could enhance prey diversity.

The commenter is correct that the study by Bond et al. (2009) was not included in the DEIS or Biological Evaluation for the California spotted owl. The Bond et al. (2009) study examined the post-fire use of an area by California spotted owls and found that spotted owls did preferentially forage in patches burned at high severity but also that they required areas that did not burn or burned at low severity for roosting (none were found roosting in areas burned at high severity). The Bond et al. 2009 report suggests that the causal relationship is likely that spotted owl prey species (primarily assumed to be dusky-footed woodrats and deer mice) flourished in shrub revegetated high severity burned areas and provided abundant food sources. The Bond et al. study did not imply that spotted owls require high severity burned areas to survive but rather that they have evolved in a fire environment that would have historically provided for a heterogeneous landscapes with a spatial and temporal mixture of unburned, low-, moderate- and high-severity burned areas. The discussion and management implications in the Bond et al. 2009 study focus on carefully evaluating post-fire burned areas which may provide foraging opportunities for spotted owls when considering post-fire salvage of fire-killed trees. As such, it is only indirectly relevant to the Big Grizzly project, which involves vegetation management and fuels reduction treatments in unburned forests. Monitoring of California spotted owls

in the Moonlight and Antelope Complex Fire on the Plumas National Forest has shown that spotted owls are no longer found within the vast areas that burned at high severity but remain in areas on the Cub-Onion Complex Fire that burned at a mixture of fire severities (Keane, 2010). The discussion in the Biological Evaluation regarding the relationship of the project to future wildfires has been expanded to address the Bond et al. 2009 study.

Comment 29: The DEIS and BE fail to adequately analyze the adverse impacts to Spotted Owls from: a) precluding future high-severity fire patches through implementation of the Proposed Action (DEIS, p. 37, Table 8); and b) active elimination of much of the existing montane chaparral habitat under the Proposed Action through herbicide application. (2)

Response: *Table 8 on page 37 of the DEIS displays predicted effects to fire behavior by alternative within the treatment units. Since the action alternatives of the project would only be treating between 26% and 31% of the project area, it is likely that some portion of the untreated areas of existing heavy fuels would be subject to high severity wildfire. Thus it is not expected that the action alternatives would preclude high severity fire patches across the project area, even if there is less likelihood of high severity fire within the treatment units.*

Similarly, the action alternatives would not eliminate montane chaparral habitat from the project area. Within the project area, 60 acres of montane chaparral vegetation types are found outside of past and proposed treatment units within the project area. Outside of the proposed treatment area, patches of chaparral also exist within the understory of some forested areas that are not considered pure chaparral vegetation types. These areas would not be treated by this project. Treatment with herbicides are planned within proposed areas to be planted with conifer trees and treatments are designed to provide a short-term reduction in shrubs where they are competing with conifer seedlings to the extent that the shrubs substantially threaten tree seedling survival and growth. Treatments are not designed to completely eliminate montane chaparral from these planted areas and past experience with similar treatment on this Forest has shown that some shrubs are likely to remain in treated units, although at lower densities than in the untreated condition. This project is not planned with treatment to type-convert natural chaparral areas to conifer forests. In addition, thinning in some units would slightly increase the amount of light reaching the forest floor such that there is the potential for more patches of shrubs in the future than currently exists. This would be tempered by future prescribed burning that could both kill and regenerate the shrubs over time. (Also see response to comment 27).

Comment 30: The DEIS and BE fail to adequately analyze the impacts of the Project on future large snag levels, Spotted Owl prey levels, and Spotted Owls. Verner et al. (1992) recommended at least 20 square feet per acre of basal area of large snags (over 15 inches dbh), or about 7-8 large snags per acre on average, for suitable spotted owl habitat. Abundant large snags are essential for spotted owls because owl prey species depend upon them (Verner et al. 1992). The DEIS, on p. 160, states that there are currently an average of 7 large snags per acre in the Project area, and the BE, on p. 29, states that the current basal area density of large snags in the Project area is 21 square feet per acre—equal to the minimum amount recommended by Verner et al. (1992). The DEIS and BE admit that the Project would reduce future large snag densities by reducing stand density and reducing competition between trees. However, neither the DEIS nor the BE provides any estimate of the extent of this reduction, despite the fact that the Forest Service's FVS modeling allows such estimates (see above), and none of the Project documents provide any analysis or estimate of the adverse impacts on Spotted Owls as a result of proposed stand density reduction. This is particularly troubling in light of the fact that the current basal area of large snags is just barely at the level recommended by Verner et al. (1992), meaning that the Project would certainly reduce large snag densities below the recommended level of 20 square feet per acre of basal area (of snags over 15 inches in diameter at breast height). The DEIS and BE are fatally flawed under NEPA for failing to analyze this. (2)

Response: *See response to comment #26. The project complies with current direction for snag retention in the LRMP as provided in the 2004 Sierra Nevada Forest Plan Amendment. Snag retention*

guidelines within the vegetation types of this project call for providing a generally continuous supply of snags and live decadent trees suitable for cavity nesting wildlife across a landscape and for generally retaining at least four of the largest snags per acre. Desired conditions within HRCAs and PACs call for providing higher than average levels of snags and down logs but no specific quantitative minimum levels are specified. In general these areas are managed for higher residual stand density which is expected to contribute to higher levels of snags and down logs through tree mortality over time in these areas. Project design features for all action alternatives call for only removing snags greater than 15 inches diameter if they are a safety hazard to woods workers or the public. From experience in similar projects, very few snags are removed during mechanical treatment, generally only those in proximity to roads and landings (pers comm. Jim Ingram, Sales Administrator, Georgetown District).

In treated areas, it is acknowledged that reducing stand density would likely have the effect of reducing competition among trees which would allow the residual trees to grow to larger diameter and become older. Although improved tree vigor is expected to reduce mortality compared to no treatment, individual tree mortality from insects, primarily during periods of drought, is still expected. Thus, in treated units, it is likely that there will be a greater availability of larger and older snags in the long term. The project is designed to reduce the potential for a large high severity wildfire that could kill the majority of trees within the project area in a very short timeframe, therefore this project would better ensure a continuous supply of both suitable spotted owl nesting and roosting habitat and a supply of medium and large diameter trees that are available to provide current and future snags.

Comment 31: The DEIS, on p. 141, claims that Gutierrez et al. (2009) found that Spotted Owl populations are "stable" on the Eldorado National Forest 1992-2007. This is hard to accept, given that Gutierrez et al. (2008 [p. 12 and Fig. 3]) found that Spotted Owls had declined steadily on the Eldorado National Forest 1992-2006. ***Please provide me with Gutierrez et al. (2009) (it is not publicly available).*** (2)

Response: *The Gutierrez et al. (2009) report presents the Annual Results of the long standing spotted owl demographic study that overlaps the project area. The commenter cites to the report from the same study area for 2008, while the DEIS uses the report from 2009, the latest and best available scientific information for the study area. The commenter cites to p. 12 and Fig. 3 in the 2008 report. On p. 12 that report states: "The random effects means model suggested that annual estimates of [lambda] were, on average, slightly less than 1.0 from 1992 to 2005..." On p. 13 the authors state: "Our analysis of population rate of change on the Eldorado Density Study Area indicated that lambda for the population of territorial owls has gradually declined over the course of our study." They continue to state: "We estimated that the average lambda over the course of our study was slightly less than 1.0, but the 95% confidence interval of this estimate overlaps 1.0." The 2009 report, which was produced by the same primary authors as the 2008 report and which covers the analysis period 1992-2007, found (p. 12) that "The random effects means model suggested that the population has been stable from 1992 to 2007..." They further state: "We estimated that the average lambda over the course of our study was 1.00, indicating a stable population size." Figure 3 in both the 2008 and 2009 Annual Results reports represent a graphic display of the estimates of the annual rate of population change over time. In the 2008 report, Gutierrez et al. calculated a fitted line for a log-linear time trend based upon their top-ranked model which shows a declining trend from 1992-2006. In the 2009 report, Gutierrez et al. calculated a fitted line for a quadratic time trend based upon their top-ranked model which shows a stable or slightly recovering trend for the period 1992-2007.*

A copy of Gutierrez et al. (2009) was provided to the commenter 0n 3/23/2010.

Comment 32: The DEIS, on p. 115, references "initial results" of Gutierrez et al.'s current monitoring study on the effects of, among other things, mechanical thinning, implying that Project activities would not harm the owls. However, the DEIS fails to provide the hard data from this study, as required by NEPA. Please provide the "initial results" of Gutierrez et al., referenced on p. 115 of the DEIS, including any data regarding the effect of mechanical thinning on Spotted Owl occupancy, foraging, radio-telemetry

use patterns, fecundity, or survival. (2)

Response: *The discussion on page 115 of the DEIS describes the suitable habitat for the species in the affected environment section of the DEIS for the California spotted owl. The DEIS and California spotted owl BE state that " in Gutierrez's recent modeling of sites on the Eldorado National Forest within the regional demographic study, initial results indicate that a small portion of owl sites with the highest quality of habitat contribute the vast majority of input into the owl population. These few sites are sites that have the highest amounts of dense canopied, older forest" in reference to the Eldorado demography study results. Similar conclusions are discussed in Gutierrez et al (2008) page 21 "simulation modeling of potential habitat loss on population dynamics (Seamans and Gutierrez Unpublished data) that indicates spotted owls having higher amounts of habitat in their territories have higher occupancy rates and contribute more, proportionally, to population rate of change than owls having low amounts of habitat in their territory". As the information from this study used in the Biological Evaluation related to a general hypothesis that was also suggested in Seamans and Gutierrez 2007, we did not request or utilize the raw data upon which the study was based. Requests for original data would have to be made to the study authors.*

The characterization of habitat used by the owl in the area is not a conclusion on potential impacts to habitat from project activities or a description of how project activities proposed would affect the owls. The commenter is incorrect in stating that in the description of this information there is any discussion of mechanical thinning or implications that treatments would not harm the owls. General effects for treatment and species specific effects for treatment based on the definitions for suitable habitat begin on page 128 of the DEIS.

Comment 33: Doug Tempel in his declaration (as a private citizen) supporting Sierra Forest Legacy's ongoing challenge to the 2004 Framework suggests that the loss of occupancy and ongoing declining owl population trend are leading a trend toward federal listing. We submit this declaration (attached) to this comment letter and suggest that given the dramatic loss of occupied owl sites on the ENF (roughly 50% since 1992) and the ongoing declining trend after 17 years on the Eldorado Owl Demographic Study site that this project violates NFMA and its requirements to maintain viable populations of wildlife in the planning area 36 CFR § 219.19. These regulations must ensure that forest plans "provide for diversity of plant and animal communities." 16 U.S.C. § 1604(g)(3)(B). By intensively logging spotted owl HRCAs and reducing high quality nesting habitat (CSO BE at p. 30) including six HRCAs that will exceed the 20% threshold in this project alone (as modeled in the 2004 SEIS) meaning the you are increasingly outside the effects analysis decision space for the 2004 SNFPA decision...you will turn the concept of diversity protection and the value of effects analysis on its head. (2, 3)

Response: *Douglas Tempel is one of the authors of the Annual Results 2008 report cited as Gutierrez et al. 2009 in the DEIS. The Declaration by Tempel was prepared on 9/21/2008 and although it included the data for 2008 for the percentage of occupied territories (Figure 1 in the Declaration), he did not reference the latest calculation of the rate of population change (lambda) which shows that the population trend from 1992 to 2007 is calculated to be stable (see response to comment #31). The percentage of territories occupied on the Eldorado Study Area from 1990-2008 calculated by Temple in his Figure 1 must be interpreted with caution. It represents the annual number of occupied territories divided by the historic number of territories (48 historic territories in the 2009 report) but does not indicate the number of pairs that attempted nesting or that successfully fledged young. Gutierrez et al. 2009 cites to other literature to suggest that variations in the population rate of change in this study area was most likely due to variations in reproductive output and juvenile survival. Neither the 2008 nor 2009 Annual Results reports indicate a concern for the annual rate of territory occupancy. However, the Biological Evaluation has been updated to indicate that the potential decline in territory occupancy could be a concern.*

The comment mischaracterizes the proposed alternatives by suggesting that there will be "intensive logging" within spotted owl HRCAs. In all action alternatives, proposed understory thinning follows the

direction and standards and guidelines stipulated for HRCAs in the 2004 Sierra Nevada Forest Plan Amendment. For this project, additional project design features are included in the action alternatives for many of the treatment units within HRCAs. Examples of these project design features include: retention of trees with substantial wildlife tree characteristics; retention of patches of shrubs and ladder fuels within some treatment units in HRCAs to provide for prey habitat; and marking prescriptions that emphasize creation of within stand heterogeneity. In addition, in response to concerns about the extent of treatments in HRCAs coupled with the concern for a strategic pattern of treatment that reduces the likelihood of a future high severity wildfire that could impact substantial amounts of high quality spotted owl nesting and roosting habitat, a modification was made to Alternative 1. Modified Alternative 1 reduces the intensity of understory thinning in several treatment units contributing to the extent of treatment within HRCAs while allowing a more complete spatial pattern of treatments to be implemented.

The comment suggests that the project is outside of the "20% threshold" for treatment within six HRCAs and may be "outside the effects analysis decision space for the 2004 SNFPA decision". As discussed in the DEIS, the 2004 SNFPA does not set a science-based threshold for a cause-and-effect relationship between the amount of treatment within HRCAs and effects to spotted owls. The 2004 SNFPA SEIS utilizes a fire modification strategy developed by Finney (2001) which estimated that a strategic pattern of treatments across a fire prone landscape would likely need to cover 20-30% of the landscape. The 2004 SNFPA SEIS also recognized that treatment within HRCAs would be unavoidable in order to implement a strategic pattern, but expected that managers would have some ability to adjust treatment locations to reduce impacts to the most high quality habitats and thus assumed that on average, approximately 20% of HRCAs could be affected from strategic treatments across the affected Sierra Nevada national forests (USDA Forest Service 2004, p. 262, 270). The 2004 SNFPA SEIS also assumed that site specific analysis would address the potential effects of specific projects on spotted owls (USDA Forest Service 2004, p. 241). An environmental impact statement was prepared for the Big Grizzly Forest Health and Fuels Reduction Project partly to respond to concerns that the extent of treatments within spotted owl HRCAs could result in significant effects to the human environment as described in the Significant Issues section in the DEIS. The EIS examines the potential effects of proposed treatments within HRCAs, including the potential effects of treating more than 20% of HRCAs. It is acknowledged that alternatives that propose treating more than 20% of HRCAs pose more risk of short-term adverse effects to spotted owls through potential disturbance and reductions in habitat quality. This is tempered by potential beneficial effects in the long-term by reducing fuels in strategic locations that may reduce the size and intensity of future wildfires which may help protect and retain suitable habitat for nesting and foraging over time.

Comment 34: The Big Grizzly Biological Evaluation for the California Spotted Owl (Yasuda 2010) reads more like a justification for logging than an evaluation of effects to an at-risk species. While the author drills into every nook and cranny for explanations that support validation of Alternative 1, the reader is left to do the “hard look” analysis on their own.

On the one hand, the CSO BE author attempts to minimize the immediate and short term impacts with speculation on imperfections in research designs (Seamans and Gutierrez 2007) and inconsistencies in 2005 vegetation layers vs. vegetation typing used in near-by studies. He remains preoccupied with habitat models and long-term projections and is very comfortable relying on “management intent” and his comfort level with 20-year and 130-year habitat projections in the controlling 2004 Framework Plan. Preoccupied with habitat models and long-term projections, the DEIS violates NEPA by overlooking the direct impact that logging under the 2004 Framework will have on old forest wildlife over the next 20 years. See Northern Alaska Envt’l Ctr. v. Kempthorne, 457 F.3d 969, 975 (9th Cir. 2006) (“A hard look includes considering all foreseeable direct and indirect impacts”).

A similar view excerpted from the 2004 Science Consistency Review team, convened by the Forest Service to review the plan and draft 2004 Framework SEIS, explained:

"Short term effects of management activities are probably more relevant to owl persistence than long-term projections in habitat change. The latter are more uncertain and will undoubtedly be subject to subsequent changes in management direction as well as unforeseen ecological circumstances."

We contend that the CSO BE lacks substantial evidence to support the determination that logging in HRCAs and the logging of larger trees and nesting habitat will not lead to a trend toward federal listing based upon the current information in the Tempel declaration and ongoing direct, indirect and cumulative impacts for this and other projects in the ENF. (3)

Response: *The National Environment Policy Act (NEPA) requires that environmental analysis includes a "hard look" at the potential effects of a proposed project on the elements of the human environment, including the effects on wildlife species. For wildlife species, this hard look entails describing the expected direct, indirect, and cumulative effects of a project and should describe both effects that may be positive as well as those that may be negative to a species and its habitat. Although the California spotted owl has been widely studied over the last two decades, few studies have focused on studying cause-and-effect relationships between forest management practices like those proposed in this project and owl occupancy and productivity. The study by Seamans and Gutierrez (2007) is one of those few studies and is the most relevant to this project because it uses data from the Eldorado Demographic Study Area, which overlaps the project area. The "hard look" specified by NEPA requires that uncertainties and the context of relevant studies be clearly identified in the effects analysis of the alternatives. The Biological Evaluation for the California spotted owl prepared for this EIS discusses these uncertainties so that the proper context for inferences and reliance on the information and recommendations in those studies can be properly applied to this project. The method of vegetation modeling is described in the section on Forest Vegetation. To clarify and ensure a more balanced discussion, a section on assumptions regarding models and projections was added to the Biological Evaluation for the California spotted owl.*

The direct and indirect and cumulative effects are discussed in the Biological Evaluation and in the Draft and Final EIS. Direct and indirect effects caused by activity related disturbance, the amount of suitable habitat affected, the extent of HRCAs affected, the extent of disturbance in core areas nearest to owl sites, and the risk of wildfire are discussed for each alternative. In addition, effects of project activities on prey species and key habitat elements like snags and down logs are discussed.

The Draft EIS, Final EIS, and Biological Evaluation for the California spotted owl include a discussion of the anticipated and potential direct, indirect, and cumulative effects of project activities within HRCAs and the effects of removing small, medium and a few larger trees, including within nesting quality habitat for each of the alternatives considered. The Draft EIS, Final EIS, and Biological Evaluation discuss past, present, and foreseeable future projects both on National Forest and private lands within a 1.5 mile radius cumulative effects area. The Draft EIS, Final EIS, and Biological Evaluation also provides a rationale for concluding that implementing the alternatives "may affect individuals or habitat, but is not likely to result in a trend toward Federal listing". The commenter does not provide additional specific analyses or discussions that are deficient in the Biological Evaluation or identify which discussion of effects is deficient in the Draft EIS. Thus it is unknown what analyses presented in the Draft EIS the commenter believes does not provide the required "hard look".

The comment regarding consideration of the information provided by Tempel is addressed in Comment #33.

CALIFORNIA RED LEGGED FROG

Comment 35: California red-legged frogs utilize various habitat types during their life cycle. Breeding habitat consists of low-gradient fresh water bodies, including natural and manmade ponds, backwaters within streams and creeks able to hold water for minimum of 20 weeks. During driest years, juvenile and dispersing frogs utilize a wide variety of aquatic habitats not considered suitable for breeding. As such,

description of suitable habitat, on page 104, appears to limit potential aquatic habitat for the frog to only that which may be suitable for breeding and does not discuss non-breeding aquatic habitat. If a breeding population of frogs were to occur within dispersal distance of the project, it is likely that aquatic features within project area could support non-breeding frogs. Since aquatic features within dispersal distance of the project were not assessed for breeding habitat suitability, it should be assumed that appropriate habitat within the project area may be occupied.

In the course of formal consultation, under Section 7 of the Endangered Species Act, with the Service on the Sierra Nevada Forest Plan Amendment Supplemental Environmental Impact Statement, the Service provided guidance that implementation of default Riparian Conservation Area (RCA) buffers (300 feet on either side of perennial streams, 150 feet on either side of seasonal streams, and 150 feet surrounding special aquatic features) would be not likely to adversely affect the California red-legged frog provided certain criteria were met (Service's biological opinion page 212, Service file 03-F-2638). If the California red-legged frog were known to occur within an area, or surveys of breeding habitat were not conducted, then no project activities should occur within the default 300 foot buffer around all breeding habitat and within the appropriate default buffer (150 or 300 feet) around all other aquatic habitat within 1 mile of breeding habitat. Because the DEIS does not indicate whether there is suitable breeding habitat outside project area for the California red-legged frog, potential effects to the frog throughout project area should be addressed, as well as implementation of appropriate habitat buffers. (6)

Response: *The Big Grizzly Project area was reanalyzed using the 1 mile radius for CA red-legged frog (CRLF) suitable habitat. As described in the USFWS biological opinion of the Sierra Nevada Framework Plan Amendment Supplemental EIS (USDI 2003) for a not likely to adversely affect determination for CA red-legged frogs, default Riparian Conservation Area (RCA) buffers of 300 feet on perennial streams and 150 feet on seasonal streams for within one mile of suitable habitat are being provided with the fuels activities of this project, pages 23 and 24 of the Final EIS. This buffer includes all ground disturbing activities, ignition for prescribed fire, and pile burning. For pesticide use, 500 foot buffers are being implemented as well within 1 mile distance of the low gradient suitable habitat, page 29 of the Final EIS.*

A GIS analysis of suitable CRLF reproductive habitat below 5,000 feet elevation and within 1 mile of the Big Grizzly Fuels Project area did not find any pond habitat, although there are several stretches of low gradient stream habitat. These include 0.3 miles on Big Grizzly Canyon in Section 28, 0.5 miles on the Rubicon River at the southern project boundary, several 0.1 mile stretches of Long Canyon in Sections 7, 13, and 15, and 0.2 miles of North Wallace Canyon in Section 3 on private land, pages 109-110 of the Final EIS.

Big Grizzly Canyon: Surveys to USFWS protocol were performed in 2005 on Big Grizzly Canyon, the only suitable low-gradient stream reach within the project area. These surveys were two day and two night surveys, and no CRLF were observed. The low gradient reach on Big Grizzly Canyon is approximately 1.18 mile long and was determined to have suitable habitat for CA red-legged frog breeding. It flows primarily through private land in Section 28, with a ¼ mile long reach on NF land. The stream habitat has slow moving water in pools from 2 to 3 feet deep with egg braces of overhanging small branches. The stream is very shaded with about 80-90 percent canopy cover. Brown trout are common.

Rubicon River and Long Canyon: On the south end of the project, the Rubicon River flows within 300 feet of project units, and on the north end of the project, and Long Canyon lies within 0.23 miles of the project (Figure 5). Previous site assessments and/or surveys by Placer County Water Agency, in consultation with USFWS (PCWA 2010 and USDI 2008), determined that both the Rubicon River and Long Canyon flow too fast during breeding season and do not have slow backwater areas that would be suitable breeding habitat for CRLF.

North Wallace Canyon: This low gradient area on North Wallace Canyon is on private land. The creek

is seasonal with areas of shallow water not deep enough for CRLF reproductive habitat and no pools.

Protection buffers for activities (including pile burning) within 2.7 miles downstream and 2.8 miles upstream of the 1.18 mile low gradient reach on Big Grizzly Canyon included in the Project Design Criteria on pages 23-24 of the Final EIS.			
Unit #	**Activity**	**Stream type**	**Stream Buffer**
319-25	Prescribed burning	Perennial	300 feet from ignition
319-15	Thin from below with extra retention, pile, and burn	Perennial	300 feet
318-1	Improvement cut with groups less than 3 acres, plant, herbicide	Perennial	300 feet, pesticides 500 feet
320-43	Improvement cut, plant, masticate, herbicides	Perennial	300 feet, pesticides 500 feet
320-96	Prescribed burning	Intermittent	300 feet from ignition
320-67	Improvement cut with groups less than 3 acres, plant	Intermittent	150 feet

Comment 36: Discussion of RCAs (page 20) includes placement of burn piles greater than 50 feet from perennial, intermittent, and ephemeral streams. Placement of burn piles within 50 feet of aquatic features does not provide adequate protection for the California red-legged frog, as it is likely that piles in this proximity to aquatic features will be used as refuge by frogs, which will be burned, likely affecting individuals. (6)

Response: *The new analysis above (response to Comment 35) describes that buffers for burn piles have been extended, to project areas within 2.7 miles from suitable stream habitat.*

Comment 37: Site-specific protection measures in table 3 of the DEIS, starting on Page 21, do not provide for adequate protection for the California red-legged frog. While implementation of the default RCA buffers is consistent with language in the 2003 biological opinion, encroachment on these buffers has potential to affect frogs through loss of upland foraging habitat, or degraded water quality. As such, the Final Environmental Impact Statement (FEIS) should include a discussion of how these reduced buffers will affect the California red-legged frog. (6)

Response *The new analysis above (response to Comment 35) describes that buffers for burn piles have been extended, to project areas within 2.7 miles from suitable stream habitat.*

Comment 38: Page 104 contains information on location of nearest California red-legged frog sightings. This section should be updated to include confirmed 2009 sighting within an ephemeral drainage approximately 7.5 miles southwest of the project, as well as an additional sighting 9 miles southwest of the project, both near Georgetown, California. (6)

Response: *This information has been updated for the Final EIS. The nearest past sighting of CRLF was observed in Ralston Pond on Ralston Ridge in 2001 where an adult CRLF was observed, approximately 3.8 miles northwest of the project. More recently, CRLF sightings (1 adult and 1 juvenile) also occurred during summer of 2009 in a tributary to Little Silver Creek and a tributary to Bear Creek. These CRLF were thought to be dispersing from a suspected reproductive location, a pond on private land. These locations are approximately 7.5 and 9 miles southwest of this project.*

California red-legged frogs have also been confirmed in the North Fork Weber Creek drainage on Bureau of Land Management land. Here egg masses and adults have been detected in Spivey Pond between 1998 to present. This pond is approximately 14 miles south of the project. A historic sighting occurred on Traverse Creek in 1975, approximately 11.2 miles west of the project.

Comment 39: Page 110 states "Since there is no California red-legged frog (CRLF) habitat being affected by the project, there would be no direct effects...." With exception of dispersing or migrating frogs, California red-legged frogs are typically located within 300 feet of aquatic habitat, presumably utilizing this area as shelter or foraging habitat. Because the project includes treatment of these areas, including use of herbicides, this statement is inaccurate, as habitat that could be occupied by the frog may be affected. As such, Table 12 should be updated to reflect riparian habitat within RCA default buffers being treated. (6)

Response: *The new analysis above (response to Comment 35) describes that buffers for burn piles have been extended, to project areas within 2.7 miles from suitable stream habitat.*

FISHER (MARTES PENNANTI)

Comment 40: Page 124 of the DEIS, in regard to listing status of the fisher, states: "A third petition was submitted to the FWS on November 27, 2000 with the results yet to be determined." On April 8, 2004, in response to this petition, the Service published its 12-month finding in the Federal Register (69**FR**18769). The Service determined that listing of the fisher was "warranted but precluded"; therefore appropriate status for this species is as a candidate for listing under the Act. Table 17 should also be changed to reflect this status. (6)

Response: *The Forest Service understands that the species is a candidate for listing under the Act and this information will be updated and corrected in the final EIS and Wildlife BE/BA reports.*

Comment 41: In discussion on page 125 under "Potential Fisher Use Areas and Potential Movement Corridors", the DEIS describes an analysis conducted to determine what has been termed potential fisher use area (PFUAs) and potential movement corridors (PMCs), and continues to state that there are no PFUAs within the project area. However, it is unclear as to how these determinations were made, and which criteria used to establish the PFUAs and PMCs. The FEIS should include an expanded discussion of analysis and criteria used in this determination. Additionally, Table 24 lists that that are 14,335 acres of habitat for fisher in project area, making it unclear as to how there is suitable habitat, but no potential fisher use areas. (6)

Response: *According to the Eldorado National Forest Pacific fisher species account (2003), a habitat network was mapped in 1994 on the Eldorado NF by identifying areas on the Forest that come closest to providing the amounts of mature forest habitat needed within potential fisher home range areas of 6,000 to 11,300 acres in size. This resulted in a total of 11 areas being mapped as potential "fisher use areas" (PFUAs). Movement corridors providing connectivity between PFUAs were then mapped using orthophotography. Movement corridors typically followed drainages and saddles. The widths of the corridors were 600 to 1200 feet based on information in Freel (1991). The maps were created pre-framework and were utilized in analysis and conservation of fisher habitat before the completion of the Sierra Nevada Framework Plan and Amendment (2001 and 2004). This was the spatial file accessed to determine the presence/absence and amount of PFUs and PMCs within the project and cumulative analysis area. Biologists on the forest utilize these past mapped areas for indications of best habitat though they are not utilized as management areas under the framework. Since they are not utilized for management purposes they therefore do not require updates and should be removed from the analysis.*

The current framework strategy relies on old forest emphasis areas to address habitat for fisher and other old forest species as well as utilizing owls and goshawks PACs for conservation of fisher/old forest species habitat within the forest. The breakdown of late-seral habitat impacts within the analysis area into suitable, high and denning habitat should be adequate for the determination of impacts to fisher from the proposed projects as this method is utilized for all other species without specified management areas located within the analysis area.

Comment 42: Page 149 cumulative effects discussed that there exist 57,255 acres of fisher habitat in the analysis area based on a 2005 Forest Vegetation Inventory data. In assessing the PFUAs and PMCs, the DEIS relied on the 1992 Forest Vegetation Inventory. It is unclear if utilizing different data sources would result in different determinations of suitable habitat, and therefore the FEIS should incorporate analysis based on same data set, or explain rationale for using differing data sources and/or accuracy of each data source. (6)

Response: *The PFUAs and PMCs are remnants of past management practices prior to the Sierra Nevada Forest Plan Amendment. Their use within the analysis was simply as an indicator of possible prime habitat. They are not utilized for management purposes and therefore they do not require updates. The mention of PFAs and PMCs will be removed from the analysis.*

Comment 43: Table 12 does not include loss of denning habitat for the fisher, only a discussion on temporary effects to foraging habitat. Because project alternatives will result in loss of denning habitat, Table 12 should be updated to reflect amount of denning habitat lost for each alternative. Table 12 should include the area of foraging habitat that would be temporarily affected for each alternative. (6)

Response: *Table 12 on the top of page 50 of the DEIS displays Denning/Resting habitat impacted by the project. This table has been expanded in the Final EIS to include a discussion on the loss of denning habitat for the fisher as was described in the direct and indirect effects section of the DEIS and the Wildlife BE/BA.*

Table 12 on the bottom of Page 49 of the DEIS includes temporary effects to suitable habitat, which includes foraging habitat for the Pacific fisher. Suitable habitat is inclusive of habitat for reproduction and foraging. All suitable habitat is considered foraging habitat.

Comment 44: Potential effects should include an expanded discussion of modification of habitat, as it relates loss of forest complexity necessary for the fisher, and any practices that will be used to mitigate these effects (i.e., retaining certain amounts of downed materials) should also be incorporated into the document. (6)

Response: *Discussion of habitat modifications as it relates to the loss of forest complexity and effects of design criteria such as leaving down logs greater than 16 inches in diameter and patches of trees within treatment units are identified as important for fisher use are included in the Terrestrial Wildlife BE/BA for the project and are summarized in Chapter 3 of the DEIS under General Effects beginning on page 130 and under Species Specific Effects beginning on page 143.*

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SCIENTIFIC ACCURACY AND INTEGRITY

Comment 45: The DEIS, p. 76 (and Silviculture Report, p. 28), states that stands in the Project Area exceed some desired percentage of the maximum "stand density index" for ponderosa pine. There are two problems with this. First, the stands in the Project Area are mixed conifer, generally, not ponderosa pine. Second, the DEIS fails to include any citations to scientific studies to support the statement about what the maximum stand density index is, or to support the DEIS's contention that it is ecologically desirable and beneficial for forest wildlife species and biodiversity to reduce stand density below some threshold percentage. Nor does the DEIS clearly state what the target threshold percentage is, in violation of NEPA's requirement to divulge methodologies and hard data. (2)

Response: An explanation *of Stand Density Index and thresholds and maximums used in the Big Grizzly project are included in the Silviculture Report of the project and are summarized in Chapter 3 of the DEIS. Stand Density Index was not used as target threshold in the design of prescriptions for the Big Grizzly project. Rather it is used as a comparable measure of the ability to meet the stated Purpose and Need of the Project in the environmental analysis. The Purpose and Need for the Big Grizzly project identifies a need to promote shade intolerant pines and hardwoods while decreasing the amount of shade tolerant white fir and incense cedar, thereby moving stands closer to a more sustainable species composition. The Purpose and Need for the Big Grizzly project also identified a need to improve the health of trees within the project area by reducing stand density to a level where inter-tree competition is decreased sufficiently to provide for health of desired pines and oaks in treated stands into the future.*

In describing the existing condition of the project area the Silviculture Report states that:

> *"Each species has a specific upper limit in which it can survive that depends on site characteristics and species life history. Stands with Stand Density Index (SDI) values of 55 to 85 percent of maximum SDI should be considered imminently susceptible to insect attack (Bakke, 1997). Maximum SDI for desired species as incorporated in the FVS western Sierra Nevada variant are: 571 for ponderosa pine and Jeffery pine, 647 for sugar pine, 547 for Douglas-fir, 382 for California black oak, 759 for white fir, 800 for red fir, and 706 for incense cedar. Oliver (1995) however showed that for relatively pure ponderosa pine stands stand density is held at a limiting density of 365 by Dendroctonus bark beetles with mortality increasing above a SDI of 280 (60% of this limiting density. thus placing plantation stands at risk of high levels of insect mortality at lower levels than modeled in this analysis. While each species has its own limiting and maximum SDI, because one of the objectives of the project is to restore species composition of oak and pines, discussions of SDI are primarily focused on the SDI for ponderosa pine."*

The rational for focusing on Stand Density Index in terms of ponderosa pine with its lower maximum SDI rather than on white fir and incense cedar is intended to improve individual tree vigor and promote

shade intolerant species. SDI estimates can be used to indirectly assess individual tree vigor at the per acre scale. While maximum SDI levels have been estimated for many Sierra Nevada species, specific data identifying critical, or threshold, values are not common. An SDI management range has been suggested by multiple researchers. This range is meant to characterize densities between the onset of competition and the lower limit of the zone of imminent mortality. Dean and Baldwin (1996) describe a management range between 20-30 and 50-55 percent of maximum. Similarly, Long and Shaw (2005) describe the range as 35 to 55-60 percent. Mortality projections, made by the Western Sierra Nevada variant of the Forest Vegetation Simulator, initiate density-related mortality at 55% of maximum and peak mortality levels at 85%. Therefore 60% was identified in the analysis of the Silviculture Report as the threshold of concern for analysis purposes. As discussed above the 571 Maximum Stand Density Index is not relative to pure pine stands in California, but stand density relative to the 60% threshold of concern for ponderosa pine is a good measure for project activities to meet the purpose and need of promoting pine and other shade intolerant species and providing for their vigor in mixed conifer stands.

Comment 46: The Wildlife BE, on pp. 28-29, Table 13, cites Kennedy (2005) to assert that current large snag densities on the Eldorado National Forest exceed the minimum 4 per acre specified in the forest plan, and states that this information is from the Forest Service's Forest Inventory and Analysis (FIA) program. However, the citation for Kennedy (2005) says nothing about FIA and merely refers to some vague unpublished document. No methodology or hard data are provided, contrary to NEPA's requirements. ***Please provide me with Kennedy (2005) and the methodology used for this report, as well as all of the hard data used for the report (it is not publicly available).*** (2)

Response: *The following data tables developed by Kama Kennedy in 2005 based upon FIA plot data collected in 2002 and 2003 on the Eldorado National Forest were sent to the commenter on 4/15/2009. A summary of this data was displayed in the Terrestrial Wildlife BE to show Forest wide trends in snags and was cited for reference, thereby incorporating the data and methodology included in Kennedy (2005). Additionally the number of snags per acre within treatment units was collected during stand examinations for this project. Both treatment unit specific data, and Forest wide data provided by Kennedy were used as aids in making determinations relative to snag abundance in the project area.*

* Data used from Kennedy (2005)

Snags per Acre by Diameter Class by Stratum (Conifers and Hardwoods)

		Diameter Class				Total	
Forest	Stratum	10"-14.9"	15"-29.9"	30"+	less than 10"	matches "Summary Report"	
3	A3P	4.92	1.23	0.62	1.85	8.62	
3	F3N	6.81	6.72	1.74	13.59	28.87	slight difference
3	KKP	0.00	0.80	0.00	20.00	20.80	
3	L3N	1.07	1.07	0.80	16.00	18.93	
3	M3N	7.60	4.82	1.64	52.12	66.19	
3	P3N	3.14	2.26	0.81	28.46	34.68	
3	R3P	5.69	4.28	2.37	9.86	22.20	

Table output is based upon FIA plot data collected in 2002 and 2003 on the ENF.
Vegetation strata have been lumped within the stratum species label, and labeled with the strata designation which represented the greatest number of plots in each lumped category.

Data was provided by Kama Kennedy from the Remote Sensing Lab on June 21, 2005.

Coding for stratum

Timber type	A		alpine	
	F		eastside mixed conifer	
	K		Knobcone pine	
	L		lodgepole pine	
	M		westside mixed conifer	
	P		Ponderosa Pine	
	R		Red fir	
Tree size Class		3	12-23.9 inches	
Canopy Closure	P		Poor	
	N		Normal	0-39%
	G		Good	40-69%
				>70%

Comment 47: The DEIS, p. D-1, implies that the Proposed Action is consistent with the Forest Service's North et al. (2009) report. This is inaccurate. Nowhere do North et al. (2009) recommend removal of large old trees 24-30 inches in diameter, and North et al. (2009) repeatedly recommends against removal of such large trees. Moreover, North et al. (2009) recommend against removal of pines, and nowhere does the Big Grizzly Project Proposed Action state that removal of pines (even mature pines) will be generally avoided. (2)

Response: *Appendix D of the DEIS displays the strategy of North et al. and discusses how the Forest Service is implementing that strategy with the Big Grizzly project, or if we are not meeting the specific criteria described in the paper why this is so, and why we feel we are still consistent with the overall strategy and goals defined in the paper. It is important to note that this paper is intended to summarize the latest science on how land managers can treat forests to concurrently provide for fuels reduction ecosystem restoration, and wildlife habitat, not override site specific prescriptions based on field surveys or to develop a "standard and guide" for management activities (page ii, second printing with addendum).*

The characterization of the 24-30 inch trees proposed for removal in the project area as "large old trees" is inaccurate. The trees between 24 and 30 inches that are proposed for removal in the Big Grizzly project area are intermediate in size as the definition of large varies with forest type and site productivity. Based on stand exams in treatment units, trees in this size class are typically between 80 and 100 years old, relatively young for species that live between 300 and 700 years on average. Stand exams show that in treatment units there are approximately 12 trees per acre between 24 and 29.9 inches dbh and another 7 trees per acre larger than 30 inches with the largest recorded in a treatment unit ranging up to 81 inches dbh in size. Page 8 of the Silviculture Report shows the average diameter distribution of stands proposed for treatment with thinning from below. On average proposed treatment would leave 15 trees per acre greater than 24 inches within treatment units. Within the project area locations with greater numbers of larger trees are typically identified Protected Activity Centers for California spotted owl and northern goshawk. These areas would not have any larger trees removed, but would remain at elevated risk from insect and wildfire mortality compared to treated stands, but presumable less than without treatments nearby that serve to reduce risk in large areas of high density stands.

North et. al (2009) recommend against removal of these sized trees for fuels reduction purposes, as the typical ladder fuel in stands is comprised of the 10 to 16 inch dbh size classes, however they do recognize that some of these intermediate-sized trees can still function as a ladder fuel. They further discuss the

recognition that there are other reasons these trees may be thinned. North et al (2009) pages 13-14 suggest that "other ecological objectives such as restoration of an active fire stand structure, managing for habitat that includes shrubs, or accelerating the development of large size in the leave trees" may be reasons to remove these trees. The Big Grizzly project does not propose to remove trees in the 24-30 inch dbh size class for fuels reduction. The Purpose and Need for the project to increase forest resilience by improving stand vigor to disease and insect mortality, and the purpose and need to restore portions of the forest to the composition of tree species and size classes that are closer to the historic conditions for the area and are likely to be more sustainable into the future considering the biophysical and climatic conditions of the area are addressed by the removal of some of these trees to fully achieve the purpose and need of the project, as shown by analysis of alternative in the DEIS.

Treatment prescriptions for the Big Grizzly project favor retention of pine as one of the identified Purpose and Need elements for the project is to promote shade intolerant pines and hardwoods while decreasing the amount of white fir and incense cedar (also in the 2004 SNFPA as a Standard and Guideline on page 52 of the Record of Decision). However, based on site specific analysis and planning for treatment prescriptions, we feel that the removal of some pines is necessary to achieve stated project goals. In their second printing with addendum released February 2010, North et al. add clarity to the intentions and suggestions in their paper by clarifying that the "paper is not intended to be a "standards and guides" that prescriptively dictates forest management." The addendum further goes on to say that "We overstated the need to avid thinning pine trees, particularly large pines….. In general, leaving pine and thinning white fir, Douglas-fir, and incense-cedar will help restore historical species composition and increase the forest's fire resilience. There are forests, however, where removing pine can reduce fuels, decrease risk of drought or insect induced mortality, and accelerate the growth of the residual pine trees."

Comment 48: The DEIS, on p. 71, states that thinning is needed to "restore" historic stand structure, but conveniently defines this in terms of trees per acre, citing Bouldin (1999). However, if the results of Bouldin (1999), for stands circa 1935, are compared to the current condition in the Project area in terms of *basal area*, then little or no thinning would be proposed. What is the scientific basis for concluding that trees-per-acre is a more important factor than basal area, especially given the importance basal area has to Spotted Owls (Verner et al. 1992). (2)

Response: *The commenter is incorrect in his discussion on the statement of need on page 71 of the DEIS and the definition of that need in terms of trees per acre. The commenter is correct in that Page 71 does show a difference in species composition in terms of trees per acre from historic stand structure to current structure. The DEIS on page 71 describes the current condition of the forest in terms of changes in forest composition over time and does not state a need nor does it define a criteria for measurement. Page 72 is a continuation of that section and goes on to show how the basal area dominance of pine has been reduced over time while the basal area dominance of white fir has substantially increased. This data was used in developing the Purpose and Need for the project. Nowhere in the analysis or in the project description were trees per acre presented as a more important factor than basal area as wrongly asserted by the commenter. Because the two are intricately linked to describing stand composition and structure both measures are discussed throughout the DEIS.*

It is important to note that changes in basal area are predicted to be very small with the proposed project, while changes in the number of trees per acre are expected to be much greater. This is because larger trees contain more basal area than small trees. Because we are trying to restore portions of the forest to the composition of tree species and size classes that are closer to the historic conditions for the area and are likely to be more sustainable into the future considering the biophysical and climatic conditions of the area by promoting shade intolerant pines and hardwoods while decreasing the amount of shade tolerant white fir and incense cedar, it is necessary to remove some trees. The basal area from the thinned trees can be expected to be replaced by growth on the more desirable residual trees, thereby moving the species composition as measured by trees per acre and basal area closer to the desired conditions for the project area.

Comment 49: The DEIS, on p. 76, Fig. 25, shows that the Proposed Action would remove 20% of the large old trees 24-30 inches in diameter, despite the fact that p. 71, Fig. 21, shows that trees in this size class have declined since 1935 (Bouldin 1999). The DEIS does not explain why any trees over 24" in diameter are proposed for removal, or how this meets the stated purpose and need of "restoration". (2)

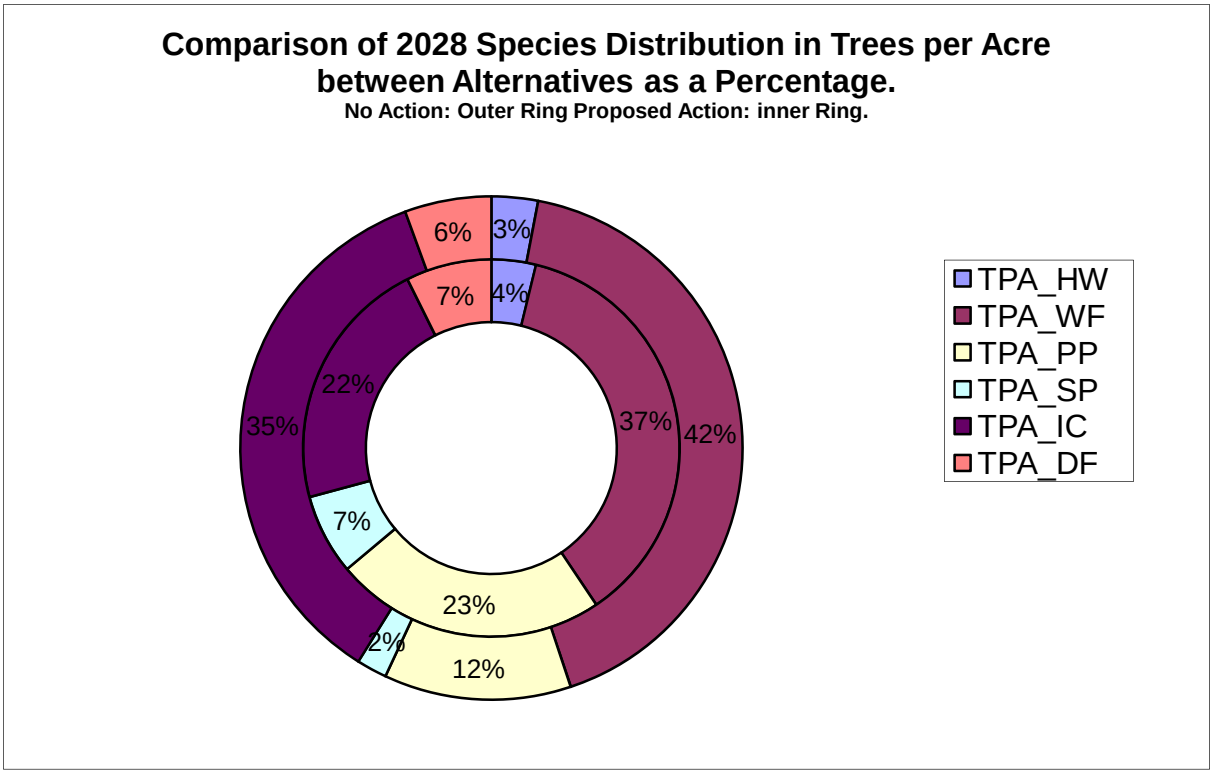
Response: *Because the intention of the Big Grizzly project as stated in the Purpose and Need is to restore portions of the forest to the composition of tree species and size classes that are closer to the historic conditions for the area and are likely to be more sustainable into the future considering the biophysical and climatic conditions of the area by promoting shade intolerant pines and hardwoods while decreasing the amount of shade tolerant white fir and incense cedar, it is necessary to remove some trees in 24-30 inch dbh size class. The proposed project would remove between 1 and 4 trees per acre average in this size class. The vast majority of trees in this size class proposed for removal (typically 80% or more in any unit) are white fir. Where proposed for removal with thinning, these trees are not in a dominant overstory crown position. Given that these areas already have a limited supply of moisture and nutrients; excessive numbers of trees further limits individual tree growth. By favoring residual trees, individual tree vigor and stand vigor are expected to increase, thereby increasing stand resilience to disturbance. Within identified Annosus root rot areas in Stand Improvement units experiencing high levels of tree mortality, the removal of 24-30 inch trees, mostly white fir, is proposed to be reduce root to root contact of susceptible species. The planting of these areas with pine will further increase the resilience of these stands to Annosus induced tree mortality. As discussed above in the response to Comment #47, proposed treatment would retain approximately 15 trees per acre greater than 24 inches within treatment units. Achievement of the Purpose and Need through removal of these trees is clearly illustrated in the analysis and comparison of the effects of the Non-commercial Alternative on Forest Vegetation summarized in Chapter 3 of the DEIS, and the diameter limit alternatives not analyzed in detail contained in Chapter 2 of the DEIS.*

Comment 50: The Silviculture Report, p. 37, Fig. 4.1-7, shows that, overall for commercial logging units in the Project Area, the Proposed Action would NOT increase pine basal area or cause a relative reduction in fir/cedar basal area, and, in fact, it would cause the opposite result. Moreover, the Silviculture Report, p. 46, Fig. 4.2-4, shows that the No Action alternative would cause approximately the same result as the Proposed Action (No data on this is provided for the Non-commercial Alternative, which violates NEPA's "hard look" requirement). This is contrary to the stated purpose and need for the project in the DEIS, and contradicts the DEIS's assertions that the Proposed Action would reduce fir/cedar and increase pine. (2)

Response: *As discussed above in the Response to Comment 50, very little basal area is being removed, because of the thinning from below design of the project. More small trees are removed, which has a much larger impact on the number of trees per acre than basal area. The commenter is correct in that the project does not immediately increase the basal area of pine, and that the absolute basal area of pine is immediately reduced through cutting, since some pines are proposed for removal based on the design criteria of the project. However, the commenter is incorrect in asserting that this project would not achieve project goals and would in fact achieve the opposite result. As shown by the FVS modeling the relative and absolute basal area of pine with the No Action Alternative is expected to decrease over time. The relative basal area of pine compared to other tree species in the stand immediately decreases with the Proposed Action, then increases above the No Action Alternative within 20 years. The absolute basal area of pine with the Proposed Action is expected to increase above the No Action by 2045 and continue to increase while the basal area of pine in the No Action Alternative would continue to decrease. The project does not immediately achieve desired future conditions in these stands, but rather changes the trajectory of the stand so that they move toward the desired future conditions. The project increases pine and hardwood basal area in the stand overtime by maintaining the vigor of these trees in the stand and allowing more growth on the residual pines and hardwoods.*

Year	Basal Area per Acre with the No Action Alternative by species						Basal Area per Acre with the Proposed Action by species					
	Hardwood	Douglas-fir	Incense Cedar	Ponderosa Pine	Sugar Pine	White fir	Hardwood	Douglas-fir	Incense Cedar	Ponderosa Pine	Sugar Pine	White fir
2011	18	15	48	51	8	110	18	12	29	38	7	87
2015	18	16	51	53	8	115	19	13	32	41	8	92
2019	18	16	53	53	9	121	19	14	34	43	9	98
2029	18	18	59	54	10	133	19	16	40	49	10	111
2039	17	18	61	54	12	140	19	18	44	53	12	123
2049	16	18	64	54	13	144	19	18	48	56	14	131
2059	16	18	63	53	14	147	18	19	50	57	17	139

Because the stands are currently dominated by white fir, and thinning from below by definition does not propose to remove the overstory, overstory white fir within the stands will continue to increase in size, thereby increasing the basal area of white fir within the stands also. This is not counter to the stated project goals as it is also recognized that the proportion of stands occupied by very large white fir has also been reduced on the landscape compared to historic conditions and conditions that would benefit wildlife use. By cutting numerous small trees that do not contain much basal area, but contribute heavily to inter tree completion through demands on limited resources and increase fire risk, the change the project makes is that residual trees are able to grow faster thereby transferring future basal area growth from the numerous small trees per acre to the residual trees. This allows for increased basal area on more vigorous, larger trees, than the No Action, or the other action alternatives. Also it is important to note that the increase in the relative percentage of white fir per acre with the Proposed Action is directly related to the decrease in proportion of incense cedar, not to the decrease in the basal area of pine.



Comparison of 2028 species distribution in Trees per Acre Between Alternatives						
	TPA_HW	TPA_WF	TPA_PP	TPA_SP	TPA_IC	TPA_DF
No Action	6	82	24	4	70	11
Proposed Action	7	65	41	12	38	13

In terms of trees per acre, pine would become much more dominant and cedar and fir less dominant. Due to past events discussed in Chapter 3 of the DEIS, it is recognized that several areas of the landscape are currently lacking pine. Pine would be restored to these areas with the project; however, the small planted pine trees would not contribute to basal area measures until their size increases. As these trees grow however, the basal area in the stands occupied by pine is expected to dramatically increase, as becomes evident in the later projected decades in this analysis as shown in the Silviculture Report for the project.

Additionally the commenter states this data was not provided on the Non-commercial Alternative, which is incorrect. As described in the Silviculture Report for the Project and Summarized in Chapter 3 of the DEIS, the 12 inch diameter limit would retain approximately 17 trees per acre greater than 12 inches that would be removed in the Proposed Action. Because stand densities would not be reduced to a level that is below the threshold of concern, it was concluded that ponderosa pine, sugar pine, Douglas-fir and black oak would still remain at increased risk for drought and insect attack mortality and therefore objectives to improve stand vigor and resilience would not be achieved. Because the trees removed with the Non-commercial Alternative only consist of very small trees that results in only a small amount of basal area being removed (<1 square foot per tree) it was concluded in the analysis that cumulative effects would result in similar effects as the No Action Alternative. With the Non-commercial Alternative approximately 25 square feet of basal area is removed per acre. Less incense cedar and white fir would be removed, maintaining higher proportions of basal area of those species in the stand.

Further analysis of the Non-commercial Alternative for the Final EIS has shown that the basal area of ponderosa pine would be maintained similar to; although less than the No Action Alternative for the next several decades and that the basal area would be higher than the Proposed Action immediately following harvest, but within 10 years the Proposed Action would result in higher basal area for ponderosa pine. It is expected that basal area of ponderosa pine would continue to increase with the Proposed Action, where after about 30 years the basal area increase ceases with the Non-commercial Alternative. Over time the basal area of ponderosa pine would be expected to decrease with the Non-commercial Alternative. For the Non-commercial Alternative, the basal area of ponderosa pine would be maintained slightly higher than with the No Action Alternative. Effects to basal area of sugar pine, hardwoods, and white fir would be similar to the No Action.

Year	Basal Area per Acre with the Non-Commercial Alternative by Species					
	Hardwood	Douglas-fir	Incense Cedar	Ponderosa Pine	Sugar Pine	White fir
2011	18	14	47	46	8	110
2015	18	13	40	40	8	105
2019	19	14	43	42	8	111
2029	19	15	44	43	9	117
2039	19	17	51	45	10	131
2049	18	18	55	44	12	143
2059	18	19	56	44	13	148

Comment 51: The Silviculture Report, pp. 30 and 43, Figs. 4.1-3 and 4.2-2, shows that the No Action Alternative would result in more large trees per acre by 2050 than the Proposed Action, for trees >20", >24", >30", and >36" in diameter at breast height (No data on this is provided for the Non-commercial Alternative, which violates NEPA's "hard look" requirement). This is contrary to the stated purpose and need for the project in the DEIS, and contradicts the DEIS's assertions that the Proposed Action would somehow accelerate the density of large trees in the Project Area. (2)

Response: *The commenter is incorrect in stating that the Silviculture Report shows that the No Action Alternative would result in more large trees per acre by 2050 than the Proposed Action for trees greater than 20", 24", 30", and 36" in dbh. At no time in the projected analysis is there a difference projected for the number of trees per acre greater than 36 inches dbh. In 2050 there is one tree per acre difference in the 30 to 35.9 inch diameter class and two trees per acre difference in the 20-24 inch diameter class, but none in the 24-30 inch size class. The one tree per acre difference in the 30-35.9 inch diameter class is more likely a function of the modeling algorithm, then an actual difference in expected results, as the increase only appears in the one modeled cycle and is gone by 2060. It is important to note that models are an abstraction of reality and are not to be relied on as always showing the truth. Modeling is used to verify and support professional analysis, not to replace that judgment. The difference in trees 20-24 inches in size emerges in 2050; however this difference is maintained into the next cycle, and is therefore probably a more realistic difference.*

While it is a project goal to maintain and create more trees per acre in the greater than 20 inch dbh classes, it is also important to provide for the appropriate species composition with project activities. As

discussed above in Comment 52 large trees of the desired species are not expected to be promoted, or retained into the future with the No Action Alternative. Because the Proposed Action removes trees size classes less than 30 inches in order to achieve stated elements of the Purpose and Need including promotion of shade intolerant pines and hardwoods, and decrease white fir and incense cedar, it is expected that in the short-term trees in these size classes would be less than with the No Action Alternative.

The 2 additional trees per acre in the 20-24 do not show that reduced density would not increase the growth of residual trees, as asserted by the Commenter, but rather illustrates that more trees would be immediately left in that size class as a result of not removing them with the Proposed Action. The fact that the Proposed Action is modeled to produce the same number of trees per acre greater than 20 inches by 2050 shows despite the removal of 20% of these trees there is enhanced growth on residual trees that is expected to maintain and increase these size classes into the future as described in the analysis of the Proposed Action.

As stated in the analysis for the Non-commercial Alternative, trees greater than 12 inches that would be removed with the Proposed Action would be retained with this Alternative, therefore effects to trees per acre in the size classes above 12 inches diameter, are expected to be similar to the No Action Alternative.

Comment 52: The Cumulative Effects analysis by law (*CSNC v. Eldorado National Forest* 2005) can not solely be limited to the Project Area (Silviculture Report pg. 26). Cumulative impacts occur to wildlife species and to other resources (soils, water, plants, air quality etc.). Some of the resources move and spend part of their time and energy in home ranges larger than the project area such as California spotted owls. Owls also migrate elevationally, and disperse as juvenile birds attempting to set up new territories[1]. Deer move from winter to summer ranges, have fawning grounds and holding areas that encompass landscapes much larger than any project area [*Center for Sierra Nevada Conservation, et al., v John Berry, Eldorado National Forest Supervisor, et al.*, CIV-S-02-0325 LKK/JFM (E.D. California)]. It is clear from both the science and documentation of wildlife movement and existing case law that cumulative effects analysis for wildlife is focused on the species and the determinations need to focus on the Big Grizzly project impacts to spotted owls and other wildlife that 1) live in and move through this landscape and, 2) at a larger forest level to understand and disclose potential owl population trends and loss of occupancy since regional tracking began.

The Silviculture Report misstates the role of cumulative effects analysis in an additional way. The cumulative effects of actions "past, present and reasonably foreseeable future actions" (40 CFR § 1508.7) require the agency to take a "hard look" and the impacts of past actions on key resources. This hard look is not limited by a project area and may include a forest-wide examination of habitat loss and degradation, landscape patterns such as the checkerboard pattern of ownership characteristic of much of the landscape north and south of the Rubicon River. The present effects of past actions such as landscape pattern of large scale fragmentation has collapsed the remaining spotted owl habitat into a much smaller land-base then was historically the case. It therefore is important that the DEIS examine the owl occupancy patterns, spatial habitat arrangements and habitat quality in and surrounding the project area to accurate assess the effects of degradation of any remaining higher quality habitat. (3)

Response: *Page 55 of the DEIS describes that "It is important to keep in mind that the cumulative effects analysis areas for the various resources are not always identical. For instance, an aquatic environmental analysis might be based on a watershed boundary, while the sensitive plants analysis is tied to a particular set of habitat types and topographic features." Cumulative effects boundaries are those that are identified by a resource as impacted spatially and/or temporally by an action. The statement on Page 26 of the Silviculture Report is taken out of context by the commenter. Page 26 of the Silviculture Report describes only the cumulative effects analysis area for the analysis of project impacts*

[1] In Layman's 1988 thesis on the Eldorado NF one juvenile spotted owl migrated 75 miles south of the study area.

on Forest Vegetation. Based on expected effect to Forest Vegetation from the Proposed Action, No Action, and Alternatives, it was determined by the Silviculturist that the project boundary was the appropriate boundary for the cumulative effects analysis. Nowhere in the Silviculture Report is any cumulative effects analysis conclusions derived for wildlife.

The cumulative effects analysis for each individual resource is described in individual reports for the project and are summarized in Chapter 3 of the DEIS under each identified resource area. In particular the cumulative effects analysis area for the California spotted owl are described in the California Spotted Owl BE/BA for the Big Grizzly Project and is summarized on page 128 of the DEIS.

Comment #53: While the Wildlife BE describes over 3,500 acres of large snag decrease (Wildlife BE at 30) in the short and long term while the Silviculture report (Appendix B pg. 6) says cut no snags >16" dbh. Snags are a key habitat feature that should be retained in any project. Which is it? There should be only very minor large snag decrease in a project claiming to be consistent with the GTR. (3)

Response: *Snags greater than 15 inches dbh are not proposed for removal in this project except where they present a human hazard. The Wildlife BE and Silvicultural Report are not inconsistent in relation to their snag assessment for the project as both describe reasons why snag number may change as a result of project activities. While no large snags are proposed for removal for commercial use or fuels reduction, an immediate decrease of some snags is expected due to hazard tree removal. Snag loss is also expected through burning, although it is unknown if snag recruitment will result in no net change. Additionally, by improving individual tree and stand vigor a reduction is expected in future large snag recruitment. FVS modeling in the silviculture report validates this trend showing a slight decrease in snag numbers following treatment after 2011 and through 2038. Large snag numbers are expected to remain as or more abundant than the desired minimum per acre as required by 2004 Sierra Nevada Forest Plan Amendment.*

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MISSING INFORMATION

Comment 54: The DEIS, on p. 16, refers to "gap establishment" for the Proposed Action, but fails to specify or estimate the number of acres of "gaps" that would be created through logging. This impact must be analyzed. (2)

Response: *Page 16 of the DEIS specifies the number of "gaps" that would be created from logging in describing that " In order to facilitate the restoration of pine species to stands, the creation of gaps of up to 3 acres in size is proposed within these 890 acres of stand treatments.... Gaps would be established on approximately 10% of the acres in any given stand." Appendix A of the DEIS identifies the specific units for proposed "gap" expansion.*

Comment 55: The EIS notes that under EO 12898, environmental justice analysis [pages 15, 172, 179-180] were completed. Chapter 2.2 states that during the scoping process, letters outlining general existing conditions, proposed treatments, and acres planned for treatment mailed on January 20th, 2009 to 37 individuals and organizations that had express interest in this project. Also the public was asked to provide comments on the project. Chapter 3.19 determined that low-income and minority populations live in and/or recreate in the vicinity and activities proposed for the Big Grizzly Fuels Reduction and Forest Health Project would not discriminate against these groups. While scoping was conducted the EIS failed to describe collaborative activities which were conducted with these groups and recommendations and/or suggestions received.

In making determinations regarding disproportionally high and adverse effects on minority and low-income populations, mitigations and enhancement measures and all offsetting benefits to the affected populations should be taken into account. The size of target populations should not be used as a governing factor in environmental justice analysis. Instead, impacts accruing to targeted populations must be compared with impacts accruing to non-target populations to determine if a project outlined by Big Grizzly determines whether a disproportionate impact exists.

Upon receiving voluminous public comment on the proposed projects, we are unable to determine if a repository and/or website is established for public review. Post information with the final EIS that described significant issues identified during the public involvement process and were used to formulate alternatives. (7)

Response: *Page 15, section 2.3 of the DEIS identifies significant issues recognized during the public involvement process that were used to formulate alternatives. Public involvement efforts along with issues raised by the public in relation to the implementation of this project are documented in Chapter 2 of the Draft EIS and on pages 15-16 of the Final EIS. Scoping was conducted to elicit comments on the Proposed Action from all potentially interested and affected individuals and groups without regard to income or minority status. The Draft EIS was posted on the web at* http://www.fs.fed.us/r5/eldorado/projects/biggriz/index.shtml *to facilitate public review.*
No issues identified through public participation were identified in relation to Environmental Justice.

Based on the composition of the affected communities and the cultural and economic factors, the activities that are proposed would have no disproportionately adverse effects to human health and safety or environmental effects to minorities, low income, or any other segments of the population.

Within the Big Grizzly project area the primary uses are firewood collection, dispersed camping and hunting. The Big Grizzly project is not anticipated to have any effects on these uses and is expected to increase potential for firewood gathering in the short-term. There would therefore be no disproportionately high impact on low-income or minority populations who use the area for these purposes.

A portion of residents of the small communities near the Eldorado National Forest rely on the forest for jobs and income. National forest management directly affects the socioeconomic environment of the Sierra Nevada through employment and income derived from resource extraction production and use. Timber harvest from National Forest lands provides a flow of products to area industries. In terms of gross revenue, timber is one of the Sierra Nevada's most valuable products. Timber is also one of the largest net contributors to county government funds through forest reserve revenue and timber yield taxes. The majority of timber production in the Sierra Nevada now comes from private harvests. Federal legislation on forest production has contributed to a reduced availability of timber production on Forest Service lands. These decisions have led to a dependence upon private timber harvesters to support communities. Timber harvesting on private lands accounts for 67-90 percent of total timber harvests in the Sierra Nevada. Although timber exports throughout the Sierra Nevada continue to be an important source of revenue, the industry has experienced a considerable drop in revenue. A decrease in available timber harvest continues to result in mill closings, lost jobs, and decreasing potential financial capital.

In terms of the Big Grizzly project, the timber volume associated with the various alternatives would help satisfy the demand by local mills for timber supplies. Funds received from the sale of timber products would be used to finance or partially off-set the need for the use of appropriated funds or retained receipts to accomplish the proposed fuel treatments. The harvesting and follow-up fuel treatments would also provide employment to local business directly and indirectly associated with logging operations and associated equipment use and maintenance. Stewardship contracting, as proposed for implementation of this project, provides the mechanism to enter into long-term contracts. These long-term contracts provide more stability for forest workers than several short-term contracts.

Although, the Eldorado NF has no mandated, sustained yield targets, the Forest has attempted to offer about 20 million boardfeet of timber/year which is equivalent to the timber volume that the local mill has on average purchased and processed from the Eldorado NF over the last decade. Public comment and collaboration with local industry groups emphasize the contribution the proposed project makes in terms of stabilizing local timber processing infrastructure.

Analysis on direct, indirect and cumulative effects of the proposed project on human health and safety identified potential risks to human health. These risks were not generally above accepted norms. By adhering applicable laws, regulations and policies, there is expected to be no disproportionately high impact to low-income or minority populations as a result of project implementation.

Comment 56: Provide details describing the CAA General Conformity requirements and the Placer County Air Pollution Control District's Smoke Management Plan. The DEIS States that Placer County is in the Federal non-attainment area for ozone and that standards have been set for ozone precursors: volatile organic compounds (VOC) and nitrogen oxides (NOx) (pg. 170). The proposed Big Grizzly project includes prescribed burning and logging activities that could result in air emissions of VOC and NOx, as well as PM10. In accordance with the Clean Air Act (CAA) General Conformity requirements, in federal non-attainment and maintenance areas, a determination must be made that emissions will not exceed the applicable *de minimis* threshold, a conformity determination is required to document how the federal action will affect the State Implementation Plan (SIP). The Draft EIS (p. 170) indicates that the total of tones of NOx that could be emitted by prescribed burning could exceed 10 tons. The *de minimis* threshold for NOx in extreme non-attainment areas is 10 tons per year. The document does not discuss the status of the non-attainment areas encompassed by the project, the time period for these estimated NOx emissions,

and whether or how the proposed project would conform to the SIP.

The Final EIS should describe the CAA General Conformity requirements and discuss whether and how the Proposed Action would comply with the SIP and State and local air district regulations. If a General Conformity determination is necessary, we recommend it be included in the FEIS. The FEIS should also include a more detailed description of the Placer County regulations for pile burning and smoke management, an implementation schedule, the responsible parties, and monitoring and reporting requirements. (8)

Response: *The air quality analysis in the Final EIS and in the Fire History, Fire Hazard, Fire Risk, Fire and Fuels Management, Technical Fuel Modeling, and Air Quality Analysis for the Big Grizzly Fuels Reduction and Forest Health Project have been updated with this information.*

Comment 57: Describe climate change and its effects on successful reforestation. Current research indicates that climate change could impact the amount, timing, and intensity of rain and storm events; increase the length and severity of the fire season; modify the rate and distribution of harmful timber insects and diseases; and aggravate already stressed water supplies. A significant change in weather patterns could have important implications on how we manage our forests. A number of studies specific to California have indicated the potential for significant environmental impacts as a result of changing temperatures and subsequent environmental impacts (Our Changing Climate: Assessing the Risks to California, A summary Report from the California Climate Change Center, July 2006). The California Climate Action Team released a report (2009) (available at http://www.climatechange.ca.gov/publications/cat/index.html) on the impacts of climate change to California, the latest research, and state efforts to adapt to impacts. The report indicates that estimates of the long-term risk of large wildfires in California are substantial, with increases in occurrences state wide ranging from 58% to 128% in 2085.

One objective of the project is to prevent the occurrence of uncontrolled wildfires that result in high levels of GHG. The EPA recommends that the Forest Service consider the potential effects of climate change on Forest Service resources and describe how the Forest Service will adaptively manage affected resources. For example, the likelihood of larger and more frequent wildfires could increase erosion, sedimentation, and chemical nutrient loads in surface waters, resulting in adverse impacts to water quality and quantity as well as species diversity.

We recommend that the FEIS include a more detailed description of climate change and the implications for successful reforestation. For example, describe and evaluate projected climate change impacts on the frequency of high intensity storms, magnitude of rain events and severity and frequency of insect outbreaks, droughts, and fire seasons, and their effect on success of reforestation efforts. (8)

Response: *The Forest reviewed the following climate change documents:*

- *Our Changing Climate: Assessing the Risks to California, A summary Report from the California Climate Change Center, July 2006*
- *Climate Change Considerations in Project Level NEPA Analysis. U.S. Forest Service (2009)*
- *Draft 2009 Climate Action Team Biennial Report to the Governor and Legislature (March 2009)*
- *A summary of current trends and probable future trends in climate and climate-driven processes in the Lake Tahoe Basin and the neighboring Sierra Nevada. Hugh Safford, Regional Ecologist, USDA Forest Service, Pacific Southwest Region. (Undated).*
- *"State of Knowledge." Environmental Protection Agency*
- *Climate Change; Health and Environmental Effects: Forests. Environmental Protection Agency http://epa.gov/climatechange/effects/forests.html#ref*
- *Silviculture and Forest Management under a Rapidly Changing Climate (USFS GTR-203, 2007)*

A description of climate change and an analysis of impacts from climate change on this project have been added to the Final EIS on pages 196-200.

REFERENCES FOR MISSING INFORMATION

Skinner, Carl. 2007. Silviculture and Forest Management under a Rapidly Changing Climate. USDA Forest Service General Technical Report. PSW-GTR-203.

U.S. Environmental Protection Agency. State of Knowledge-Climate Change. Online *(accessed 3/31/10) at http://www.epa.gov/climatechange/science/stateofknowledge.html*

U.S Environmental Protection Agency. 2007b. Climate Change- Health and Environmental Effects: Forests. Online (accessed 3/31/10) at http://epa.gov/climatechange/effects/forests.html

Wood, Tamara M. 2001. Herbicide Use in the Management of Roadside Vegetation, Western Oregon, 1999-2000: Effects on the Water Quality of Nearby Streams. U.S. Geological Survey Water Investigations Report 01-4065.

PROCESS

Comment 58: The Big Grizzly DEIS implements the 2004 Sierra Nevada Forest Plan Amendment which is contrary to applicable federal law see: *Sierra Forest Legacy v. Rey*, 577 F.3d 1015, 1018 (9th Cir. 2009). The Final SEIS for the 2004 Framework Does Not Provide a Full and Fair Discussion of Impacts to Old Forest Wildlife, in Violation of NEPA. The SEIS Obscures the 2004 Framework's Impacts to Old Forest Wildlife by Focusing on Long-Term Projections. The SEIS Does Not Disclose that Experts Disputed the Forest Service's Assessment of Impacts to Wildlife. The 2004 Framework Will Not Maintain Viable Populations of Old Forest Wildlife in the Sierra Nevada, in Violation of NFMA. (3)

Response: *A final ruling on the merits of the 2004 Framework ROD was issued by District Judge Morrison England on August 1, 2008, which adopted the Ninth Circuit's rationale in its May 14, 2008 opinion that the 2004 Framework SEIS's range of alternatives was inadequate under NEPA. The 2004 Framework was upheld on all other NEPA and NFMA claims. On August 13, 2009, upon rehearing, the Ninth Circuit issued an amended opinion that supersedes its May 14, 2008 ruling, leaving Judge England in a position to rule on the remedy. As a result, Judge England, on November 4, 2009 ruled that the Forest Service must address the procedural Framework defect through a supplemental EIS process, and rectifying any on-site substantive deficiency, for new fuel-reduction projects, an amplified alternative analysis at the project level. Based on the 2009 District Court ruling a Non-Commercial Alternative was analyzed for this project in the Draft EIS.*

Claims that the 2004 SEIS does not maintain viable populations and that the 2004 SEIS are a violation of NFMA have not been upheld by the 9th Circuit court, or the District court. Additionally a project specific analysis for impacts to wildlife species did not find that population viability for any species would be threatened with implementation of this project.

Comment 59: While Sierra Forest Legacy invested significant time and energy early on in this project to attempt to collaborate in getting to a sound decision and while we appreciate the work Dana Walsh, the project leader, put into the project and the DEIS layout, there was little effort focused on attempting a full PSW-GTR-220 collaboration. First, the fact that the timber was marked a year or two PRIOR to the public involvement and DEIS disclosure taints the whole process with a clear sense that the decision was made long before the NEPA process began and everything since then is "backfilling" to justify a pre-determined decision. This action violates NEPA 40 CFR § 1502.2 (g) and is poor public policy which acts to damage trust. We ask that you as Forest Supervisor halt this marking tradition immediately and for good. (3)

Response: *Preliminary marking stands in advance has not been found to be a violation of NEPA, as marking is not a ground disturbing activity and no decision has been made. The Forest Service feels that the Proposed Action has been designed as first step to implement the concepts from North et al (2009). Appendix D of the DEIS discusses the Proposed Action design relative to concepts from PSW-GTR-220. Based on collaboration with the commenter and recommendations in North et. al (2009) for increasing within stand variability and preserving structure important to wildlife, some pre-marked stands have been identified for additional marking, before implementation if the Proposed Action is the Selected Alternative. The pre-marking of trees for removal does not change the ability of the Proposed Action to meet PSW-GTR-220, however, the Forest has recognized that some of the elements in PSW-GTR-220 can be better achieved with some additional marking in these unit. Pre-marking of some of these areas does not impact the Forest's ability to return to these areas and change the selected trees, but does give a fairly reliable analysis of expected changes to stand conditions as a result of the Proposed Action and alternatives to the Proposed Action. Marking of unmarked units and final marking of units preliminarily marked during project planning will be done before the project is implemented.*

Numerous past remarks have been received from members of the public that it is helpful to have the marking done ahead of time because of the fact they see precisely how the Forest plans on applying marking prescriptions. Preliminarily marking the stands has helped with both internal reviews of what the marking actually will produce in terms of residual stand conditions, allows rather accurate estimates of the economic aspects and comparison of the various alternatives, and showings the public exactly what we are proposing to do.

We agree that public involvement in and collaboration is important to the Forest in reaching the best decision for a project. Scheduling the project work needed to design, analyze, and implement a project are management tasks that are determined by budgets, personnel, workload planning, and accomplishment planning, and does not restrict public involvement or collaboration. The Decision Maker on a project will continue to decide to what extent preliminary marking will occur on a project by project basis.

Comment 60: Sierra Forest Legacy believes that having someone other than the highly competent District Biologist write the Spotted Owl Biological Evaluation suggests a desire for a specific outcome that would support the pre-existing desired treatments marked several years earlier. The CSO BE raised the art of trade-off discussions and linguistic gymnastics to a new plateau. It seems that the more we study owl behavior the less we know but it always seems the logging is ok in spite of the uncertainty. (3)

Response: *Scoping for the Big Grizzly Project began in January 2009, with the expectation that the Draft EIS would be released in March of that year. Planning for the project had begun approximately 3 years earlier. In 2007 the District Wildlife Biologist for the Georgetown District left for another job. The position was not filled until March of 2009, well into the project planning and analysis process. Because of the designation of the Big Grizzly project area as critical California spotted owl habitat, the District needed a consistent, experienced person for the entire project planning time frame to ensure an informed, quality proposed action and analysis, not desired outcomes for the analysis as asserted by the commenter. At the time the Georgetown District had temporarily filled the District Biologist position for 120 days, but the detailing biologist had limited experience with commercial thinning projects. Additionally the 120 days was not sufficient time to complete project analysis. Because the Georgetown District and Pacific District of the Eldorado National Forest work as a zone for timber management, and the majority of the projects planned for the current time period were on the Georgetown District, it was decided by the Forest Leadership Team that the Pacific District Biologist would assist on this project to provide for continuity in the analysis.*

Comment 61: Range of Alternatives—Rx Burn Only cost in economic analysis. Project is losing a huge amount of money based on the economic analysis. The discussion in the DEIS alternatives considered and dismissed should mention up front that the project is losing money at a ratio of about 10:1 even with Alt 1 and maximum logging. Table 2 in the Economic Summary (Errington 2009) offers per area cost estimates for the project including total stumpage value of $380.597 (Table 4 pg. 16 Errington 2009) and a total of $630,597 (DEIS p. 53) for total volume revenue while project cost run higher than $5,000,000. Rx burning cost are estimated at $250.00/acre (Errington 2009). If you were to treat the 5730 acres proposed for thinning treatments the cost would be approximately $1,432,500 to use planned fire. Since the economic analysis states that most of the trees (80%) of the trees are 16" dbh or less in trees/ac prescribed fire will have high mortality in trees up to this size and accomplish much of the fuels and forest health objectives. A fire only alternative should be given full consideration. (3)

Response: *A Prescribed Fire Only Alternative was developed based on this comment, however because it is not expected to be able to meet the purpose and need for the Big Grizzly Project, it was not analyzed in detail for the reasons described in Chapter 2 of the Final EIS.*

It is true that this project is not generating much stumpage (revenue for timber products removed) to be used to accomplish the needed fuels work. Due to the national economic situation timber prices have drastically been reduced over the last two years. However, not offering the sale now may in fact create a problem with the Camino Mill not having a reliable supply of NF timber and could push SPI to choose not to open the mill again, forcing this sale and other future sales to be appraised to Lincoln which could have longer term and much greater negative economic impact. Just appraising to Lincoln would probably result in about a $50,000.00 loss per million board feet of timber hauled across the forest. This would be a million dollar loss every year if the ENF continued to offer 20 million board feet/yr of timber. Also, the Forest is expecting to use some of the retained receipts from previously completed projects whose timber values exceeded the stewardship work needs on those earlier projects, thus we expect to supplement Big Grizzly partially on the basis of timber values received when the timber markets were stronger.

However, the commenter is incorrect in the assumption that all project treatment units could be burned at a cost of $250/acre and accomplish treatment objectives. Burning costs of $250/ac are based on areas where fuels treatment such as thinning and piling are completed in the stands prior to burning. Additionally, that is the cost for a single burn. Burning under current conditions, as is proposed with the Prescribed Fire Only Alternative, results in a higher burn complexity due to the increased fuel loadings and holding concerns in fuel types that promote increased spotting potential due to lofting embers. In order to implement burning with this alternative, the burn prescription would be further limited from the implementation window with the Proposed Action in order to reduce damage, mortality and spotting potential. In order to reduce spotting potential and fireline intensities near control lines, surface fuels and fuels promoting a ladder to canopy would need to be removed. Cutting of ladder fuels and piling of surfaces fuels would reduce this potential while allowing fireline resources the ability to safely hold and patrol control lines. This would require pile burning to occur prior to implementation of understory prescribed fire. An estimated 3 entries would be needed to meet the objectives of reducing surface fuel loadings and reduction of crown fire activity within the Big Grizzly Project. During the first entry, 1 and 10 hour fuels would be reduced while high mortality rates within trees < 12" dbh would occur. Pockets of mortality of trees > 12" would be expected across the burn area. As a result of the burn, needle cast from dead trees as well as branches would accumulate within the burn area post burn. Newly created snags would overtime fall and add to the dead fuel loadings. If burning was attempted in the heavy fuel loads without pretreatment, it can be expected that the costs would be at least $300/acre for the first couple burn entries. Additionally in order to accomplish objectives would probably require at least 3 burns, thus the costs would likely be at least $850.00/ acre over 15-20 yrs.

Part of the negative cost of Big Grizzly project is the fact that we are planning on investing about $250,000 in the road system which is needed to maintain the current system and performing treatments on acres with no proposed commercial product removal. Either this work would not get done with a Prescribed Fire Only Alternative, or it would be accomplished as an added cost. The approximately 1500 acres currently proposed for mastication or brush cutting and herbicide would not be able to be treated with prescribe burning only. If these acres were treated as proposed, mastication, brush cutting, and herbicide it would still cost $1,060,000 on these acres. To treat the remaining acres it is estimated that a Prescribe Burn Only Alternative would cost, at a minimum $3,587,000 dollars to accomplish 4220 acres of burning with the minimum of 3 burns which are estimated to be necessary. However, this does not include the cost to protect wildlife trees, large trees, snags, down logs which have been identified as critical elements of habitat in the treatment units, or hand cutting and piling along fire lines. It is estimated that these activities would cost at least another $1,400,000.

While on a theoretical basis the Purpose and Need of the Big Grizzly Project to change existing forest surface, ladder and crown fuel profiles in order to reduce potential wildfire intensity and behavior to mitigate the consequences of large, potentially damaging wildfires on selected forested areas could be met using only prescribed fire, due to complexity and restrictions on implementation, the timeframe that would be needed to accomplish implementation of this project would prevent this alternative from meeting the Purpose and Need. Also, while the author is correct that the majority of trees proposed for removal in each treatment unit are under 16 inches in diameter, the commenter is incorrect in assuming that using prescribed fire alone would meet the purpose and need for forest health. By using prescribed fire as the only means of treatment with this project, objectives to improve stand vigor and resistance to disease and insect would be compromised as stand density would not be reduced sufficiently to provide for short or long-term health of ponderosa pine, sugar pine, California black oak, or Douglas-fir within most treatment units. Additionally, within dense stands with heavy fuel loading insect mortality may actually increase under the Prescribed Fire Only Alternative due to damage of residual trees. While insect attack and mortality are influenced by a number of factors including: proximity to surrounding beetle populations, other potential hosts available for the beetles, degree of fire-injury, drought conditions, stand density, individual tree vigor and other factors, given current stressed conditions for trees within these stands, additional damage to trees from implementation of prescribed burning is likely to result in increased incidence of insect attack within burned stands, and could negatively impact objectives to maintain desired residual trees, especially large pines that are desired for preservation with the project.

Ability to meet Purpose and Need objectives for maintaining and/or establishing a composition of tree species and size classes that are closer to the historic conditions for the area and correspondingly sustainable into the future, another measure of forest health, would also be compromised under this alternative. Burning with the increased fuel loading compared to the Proposed Action is expected to result in increased fire intensity. Increased fire intensity can increase mortality in desired residual trees due to increased flame lengths and crown fire initiation causing crown damage. Higher intensities heating the ground and increasing residence times in the duff and soils are also expected to cause increased mortality and damage. Heavy concentrations of 1000 hour fuels within the treatment units may create unwanted pockets of mortality in the larger diameter (> 20" dbh) conifer trees. Trees which survive may have increased stress due to damage leading to increased mortality as discussed above. Furthermore, the ability to retain important structural components of the stands such as trees with identified wildlife structures, snags, and down logs would be reduced.

In addition to potential increases in damage and mortality to overstory trees of non-plantation stands as a result of burning with current ladder and surface fuel conditions, there would not be the ability to effectively reduce brush species in plantations. Under current conditions, burning of plantation stands would not be possible without causing higher than acceptable mortality of residual trees. Therefore likelihood of moving these stands toward old growth habitat in the future would be in jeopardy.

Creating some gaps within treatment to encourage pine establishment would be possible given burning under current conditions; however, targeting individual trees, size classes or a select species of trees (white fir and incense cedar) would not. Overstory trees, ponderosa pine and sugar pine would also see mortality as a result of burning. Natural regeneration of these species would be possible in stands with a viable seed source, but species establishment is highly dependent on annual seed dispersal, weather and pest patterns, and seed bed conditions. Implementation of gap expansion within stand improvement units of currently identified gaps would not be possible. No improvements to species composition are expected to occur in stand improvement units without the expansion of existing gaps and planting of desired species. In these stands canopy cover would continue to decrease as the expansion of Annosus root disease and insects within the stands continues to kill the predominately large areas of white fir.

Comment 62: NEPA (40 CFR 1500.1 (b)) requires the information presented in an EIS be of high quality and scientifically accurate. Table 7 pg. 19 of the Big Grizzly Final Summary of the Economic Analysis (Errington 2009 and the DEIS pg. 31 2.7-C the 2001 Framework Alternative) fails to accurately summarize the economic and treatment outputs from a 2001 SNFPA alternative. The Old Forest and Home Range Core Areas for spotted owls are characterized in (Errington Table 7 and in the DEIS at 31) as having a strictly 12" diameter limit thus limiting the amount of treatment and log volume produced due to land allocation limits. In fact, the 2001 SNFPA allows for harvesting in Old Forest and HRCAs of up to 20" trees where appropriate in CWHR 4M, 4D strata and canopy reduction of up to 20% are allowed to meet fuels reduction objectives (2001 SNFPA ROD pg. A-41). Since CWHR 4M, 4D are most common in the landscape, this is a significant error. This analysis needs to be re-calculated to accurately reflect the treatment outputs for the project as required by NEPA. (3)

Response: *The Forest reviewed the economic analysis for the 2001 framework and believes that the analysis is accurate. The 2001 Framework described that the trees larger than 12 inches allowed for cutting in the CWHR types 4M and 4D strata of old forest and HRCA land allocations is incidental felling for operability necessity, thus the commenter is incorrect in implying that trees could be harvested up to 20 inches for economics or other objective of the purpose and need. The Forest Service demonstrated by examining the Non-Commercial Alternative, that harvesting trees up to 12 inches is primarily sufficient to accomplish the fuels objectives. Also under the 2001 Framework in the CWHR types 4M and 4D only a 10% reduction in canopy is permitted, not 20% as incorrectly stated by the commenter. Thus even if we needed to cut trees over 12" for fuels purposes we could cut virtually none because of the canopy closure restrictions.*

Comment 63: Include a commitment in the Record of Decision (ROD) to the Best Management Practices (BMPs) listed in Appendix B of the DEIS that specifically address soil and water quality in the Big Grizzly Project area. Appendix B states the BMPs listed will be implemented in the Big Grizzly Area if an action alternative is selected (B-1).

The EPA recommends that the ROD include a commitment to the specific BMPs that will help to reduce water quality impairment. These include erosion prevention and control structure maintenance as well as pesticide application and monitoring evaluations. (8)

Response: *BMPs are included in the Design Criteria for the project as described in Chapter 2 of the Draft and Final EIS, and would be implemented with the project.*

Comment 64: EPA acknowledges the importance of the project's goals to improve forest health, reduce fuel loading, and decrease fuels along important access roads to allow better access for fire suppression activities during fire events. EPA Support the use of thinning and prescribed underburning as important measures necessary to reduce the risk of fire, promote biodiversity, and restore natural ecological processes within the forest. We recognize the ecological significance of the Eldorado National Forest and support the inclusion of resource protection measures and best management practices described in the EIS. Protection features such as limiting the amount of new road construction will help minimize adverse

effects. (8)

Response: *The Forest Service thanks you for your support.*

Comment 65: Mason, Bruce and Girard, a resource consultant whose primary client owns timberlands in Placer County that lie north of the Rubicon river. Much of this property is located in the Ralston Ridge and Nevada Point areas; therefore MB&G is very pleased that the Forest Service is proposing fuel treatments on adjoining public lands that will also result in increased protection for the private lands in the vicinity, which are actively being managed for timber production. We feel that you have made an accurate assessment of the purpose and need for action and the four elements that were identified are very applicable to actual conditions on the ground. We agree that treatments should be intended to facilitate fire suppression efforts as well as improve the ability of treated stand to withstand the adverse effects of fire. We agree that existing forest surface, ladder and crown fuel profiles need to be modified in the project area and that existing conditions are primarily due to past management practices which favored shade tolerant species such as white fir and incense cedar. Therefore, the composition of the tree species and size classes do need to be modified so that they are closer to historic conditions for the general area. We also agree that hazard fuels need to be treated in a cost-effective manner in order to ensure the effectiveness of treatments in both the short and long terms.

We believe that the range of alternatives considered is reasonable and we are therefore in support of the Proposed Action, Alternative 1. We cannot support the other alternatives because they will fall short of achieving the desired and needed impact on the project area. Some of the concerns related to herbicides which were raised in the scoping process can be adequately addressed in the implementation of Alternative 1 through the use of best management practices and strict adherence to governing rules and regulations. We also do not agree with the concerns that precipitated Alternative 4, because the removal of trees up to 30 inches, as described in the Proposed Action, will not lead to fragmentation of the landscape and reduced habitat. However, a catastrophic wildfire in the Nevada Point area does have great potential for very significant adverse impacts on wildlife habitat.

In reviewing Table 7 on page 34, it is obvious that the Proposed Action is the best alternative because it will effectively treat the maximum acreage in the most cost effective manner. As your neighbor, we have a vested interest in the project area. We are therefore very interested in seeing a successful project competed and are convinced that the Proposed Action is the best alternative to help guarantee that success. (4)

Response: *The Forest Service thanks you for your support. The decision maker will consider the benefits, adverse effects, and short and long term risks of each alternative in formulating a decision.*

Comment 66: Sierra Pacific Industries operates nearby forest products manufacturing facilities in Lincoln, Camino, Oroville, Chinese Camp, Sonora, and Quincy. These facilities as well as our employees and the surrounding communities rely on forest products developed for management activities that occur on National Forest lands such as those proposed in this project.

As this environmental document so aptly points out in it's assessment of the affected environment under the proposed alternative (Chapter 3, pg. 75), "A more constant flow of forest products would be assured, thus facilitating long-term vegetation management options by maintaining local timber processing infra-structure". The closure of so many forest products manufacturing facilities, including SPI mills in Camino, Quincy, and Sonora highlight this loss of infra-structure in the last year. If implemented, the proposed project would provide significant resources to help stabilize local logging and lumber manufacturing firms including SPI.

SPI agrees with and supports the stated purposes and needs of the project. We also support the selection of the proposed Alternative #1 to achieve these goals. SPI commends the preparers of the Draft EIS for its completeness and clear enunciation of the logic behind conclusions drawn throughout this analysis, both

ecological and economic. We also like the large size of this project which provides economies of scale and deals with these USFS lands in a cohesive rather than piecemeal fashion.

It should be noted that the Proposed Action is very conservative forestry. Only 35% of the National Forest lands within the project area will receive any treatment at all under this proposal. Proposed silvicultural prescriptions on the treated acres are light understory thinning with a maximum diameter removal tree <30 inches dbh. Only an average of 4 trees per acre between 20 and 30 inches will be cut; with 30 trees per acre removed between 9 and 20 inches; and the vast majority to be removed being small sub merchantable trees 4-9 inches (75 trees/acre). The resulting post-harvest crown canopy levels will far exceed the minimums prescribed by the 2004 Framework guidelines. (5)

Response: *The Forest Service thanks you for your support. We recognize that proposed thinning is much lighter than the maximum allowed in the 2004 Sierra Nevada Forest Plan. Prescriptions were developed to best meet all stated management objectives.*