Summary of Response to Public Comments
Kings River Project DEIS, Sierra NF

Commenter	Comment 1	Assigned -Forest Service Response
Sierra Nevada Forest Protection Campaign (SNFPC) California Native Plant Society, Vivian Parker (CNPS) H.S. Chap. – Soc. of American Foresters (SAF)	**1. Focuses on more intense logging than allowed by 2004 ROD** - SNFPC p. 1 1a. Referring to the Purpose and Need, "the methods, locations, and intensity of many of the activities to achieve this goal are not likely to achieve them … and are not ecologically appropriate." - CNPS p. 1 "There is no urgent ecological reason for the emphasis on restoring shade intolerant species at elevations above 6,000 feet in the Sierra Nevada…." - CNPS p. 1 Referring to white fir, the proposed action violates NFMA by failing "… to preserve the diversity of tree species similar to that existing in the region controlled by the plan." - CNPS p. 5 1b. Removing large percentages of cedar and fir and perhaps some trees > 35" is important to accomplishing some of the Needs in the DEIS. - SAF	Specifically in response to **this overall comment**, the Reduction in Harvest Tree Size Alternative (No. 3) was brought forward from the DEIS where it had been eliminated from detailed study to be completely analyzed for the FEIS. Alternative 3 includes the following actions: Treatments associated with the Kings River Experimental Watershed Study. Treatments associated with the California Spotted Owl Study. Fuel reductions in the WUI. Implementation of the proposed uneven aged management strategy modified to reduce vegetation treatment to trees 30" diameter and smaller. Treatment of under stocked areas associated with existing openings by site prep, planting, and release. All treatments outside of the research areas will be consistent with the standards and guidelines in the 2004 Sierra Nevada Forest Plan amendment, including the following key provisions. Within known or estimated female fisher home ranges outside WUI, 50% of the forested area has at least 60% canopy closure. No group selection prescriptions will be implemented; however site preparation and planting trees within existing openings would occur in existing openings. **Regarding comment 1a:** The desired condition and direction to move forests towards pre-settlement conditions was set by the SNFPA (2004). Addressing questions about the need for projects such as KRP to accomplish this direction is outside the scope of this DEIS. No violation of NFMA will occur, as the diversity and stand characteristics of tree species would be more similar to those seen prior to fire suppression. The same species will be present, but the age class and proportions would change over time.

		Regarding comment 1b: Part of the purpose of restoring the pre-1850 historical forest is to bring the proportion of shade tolerant species, like cedar and fir, and the shade intolerant species, like pine and black oak, closer to the historical species composition. This requires practices that favor the intolerant species and reduce the number of tolerant species during thinning and reforestation. As described in the response to the previous comment, the action alternatives favor the removal of incense cedar and white fir. One of the Needs described in Chapter 1 is to increase the number of large trees (>35") across the landscape. The Sierra Nevada and the KRP have experienced a decrease in the number of large old trees. As part of restoring the historical pre-1850 forest conditions there is a need to reverse this trend. Large trees are an especially important component of habitat for many wildlife species such as spotted owl and fisher (Verner and others 1992). Maintaining as many large trees in the landscape as possible is important for habitat suitability. The number of large trees across the landscape can be increased by retaining the existing ones and providing adequate growing space in each stand for the medium sized trees.
Commenter	**Comment 2**	**Assigned –Forest Service Response**
Sierra Nevada Forest Protection Campaign (SNFPC)	**2. The Study design is not adequate to accomplish research objectives. - SNFPC p. 1** 2a. Violates NEPA by not meeting the purpose and need to yield useful information on the effects of treatments on wildlife. - SNFPC p. 51 2b. There is no study proposed on effect of prescribed burning. - SNFPC p. 51 2c. Violates MOU by not assigning principle investigators to UEAM and prescribed burning. - SNFPC p. 52	At the heart of **this overall comment and specific comment 2a** is concern that the research is following rather than leading the management activities. The Kings River Project was originally conceived as a management hypothesis: Will implementation of a landscape strategy such as the KRP uneven-aged silvicultural system combined with prescribed fire be able to restore forests to the historical pre-1850, fire resilient condition? This hypothesis is at the heart of the management experiment and drives all facets of the Project. Thus, the research that has been developed to support this management experiment is necessarily following the intended management activities. All planned research has been conceived to examine the response of the ecological system to the set of management prescriptions meant to implement the overall vegetation management strategy. The design of the proposed action has been an iterative and collaborative process between management and research over several years. Research needs have driven some aspects while practical considerations and management needs have driven others. PSW intends to provide scientific feedback on the

		effects of the treatments, metered out over space and time, on particular features of interest (e.g. chemical/biological elements of watersheds, key sensitive species). (For more details, see Chapter 2 – Research Section) **Regarding comment 2b:** The KRP provides the opportunity for additional studies through time. For example, the Kings River Project is now the Forest Service's western site for evaluating air pollution effects on forest ecosystems. We will continue to provide opportunities for additional research, such as on prescribed burning, within the overall framework of the Project as opportunities present themselves and principle investigators are available. **Regarding Comment 2c:** An uneven-aged management study has been conceived but will only be implemented to the extent of establishing ten management units as treatment-controls. These controls are intended for use in a future uneven-aged management study and may also be used for other study and monitoring purposes. The uneven-aged management study can not be reasonably implemented utilizing the initial eight management units because two are involved in the KREW Study and several others have significant area in the defense zone of the WUI. These focused activities preclude applying the uneven-aged management strategy to the extent necessary for this study. So, it is not necessary to assign a principle investigator at this time.
Commenter	**Comment 3**	**Assigned –Forest Service Response**
Sierra Nevada Forest Protection Campaign (SNFPC) California Native Plant Society, Vivian Parker (CNPS)	**3. Violates NFMA because near term impacts (30 - 50 years) will jeopardize survival of owl, fisher and other species.** - SNFPC p.2 3a. Fisher is currently declining in southern Sierra. - SNFPC p. 7 & 63 3b. Removal and thinning of understory will have direct and indirect impacts on fisher. – SNFPC p.16 3c. Information is not provided on fisher home	Specifically in response to **this overall comment and specific comments 3a and 3b:** Between the DEIS and the FEIS, a considerable amount of additional analysis were performed on the habitat and populations of spotted owls, fisher and MIS species. Results of the analysis are found in the description of effects in the respective sections of Chapter 3, the BA/BE for terrestrial wildlife and the **Management Indicator Species Specialist Report – Kings River Project** prepared by John C. Robinson of On My Mountain, Inc. In carrying-out the additional analysis, technical advice received from the Fish & Wildlife Service on fisher and Yosemite toad (see Appendix D) and numerous other publications were reviewed and incorporated to assure the best available science was utilized. The bibliography approximately doubled between the

	ranges, connective corridors and/or habitat elements. – SNFPC p. 63 3d. Goal for maintaining 50% of fisher habitat in CWHR4 with 50% canopy cover threatens viability. – SNFPC p. 14	DEIS and FEIS. **Also, regarding comment 3a:** There is no indication of the fisher population declining. If anything it is stable (Purcell 2006). **Regarding comment 3c:** In carrying-out the additional analysis, the biologist and silviculturist found the most appropriate area to use in describing and displaying the indirect and cumulative effects from change in canopy cover on fisher habitat was a management unit. (The average size of the initial eight management units is about the area of a 7th Field HUC.) Results of the analysis are found in the wildlife section of Chapter 3 under Indirect and Cumulative Effects. Connective corridors which are referred to as Old Forest Linkages (OFLs) were displayed and described in the DEIS on page XX and are in the FEIS on page XX. In carrying-out the additional analysis, habitat elements were more fully described with the help of the technical advice from the Fish & Wildlife Service and the review of additional publications. The revised description can be found in the wildlife section of Chapter 3 and the BA/BE for terrestrial wildlife. **Regarding comment 3d:** Specifically in response to this comment, the Reduction in Harvest Tree Size Alternative (No. 3) was brought forward from the DEIS where it had been eliminated from detailed study to be completely analyzed for the FEIS. All treatments outside of the research areas will be consistent with the standards and guidelines in the 2004 Sierra Nevada Forest Plan amendment, including the following key provision. Within known or estimated female fisher home ranges outside WUI, 50% of the forested area has at least 60% canopy closure. Specifically in response to this comment, the Reduction in Harvest Tree Size Alternative (No. 3) was brought forward from the DEIS where it had been eliminated from detailed study to be completely analyzed for the FEIS.

Summary of Response to Public Comments
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Commenter	Comment 4	Assigned -Forest Service Response
Sierra Nevada Forest Protection Campaign (SNFPC) Attorney General of California (AGC) California Native Plant Society, Vivian Parker (CNPS)	**4. Cumulative effects are incomplete because projects are listed but there is no analysis including spatially.** – SNFPC p. 2 4a. Maps provide information on location and timing of harvest but they do not show effects to fisher. – SNFPC p. 19 4b. Cumulative effects for fisher need to occur at the scale of the HS Ranger District. – SNFPC p. 20 4c. Cumulative effects does not cover MIS. – SNFPC p. 47 or adequately analyze sensitive forest resources. – AGC p. 7 4d. How much of the KRP is being addressed by CEA is not clear. 4e. Adaptive management concept cannot cure defects in the DEIS cumulative impacts analysis. – AGC p. 11 4f. Concerning the conversion of chaparral and hardwood stands to tree plantations on wildlife: "The cumulative effects of eliminating habitat for wildlife from the installation of commercial pine plantations on public and private lands throughout the Sierra Nevada was not been analyzed (sic) in the DEIS."	Specifically in response to **this overall comment and specific comments 4a, 4e and 4h**, a considerable amount of additional analysis were performed on past and present projects on the High Sierra District, watershed effects from the action alternatives, some sensitive species (spotted owl, fisher and goshawk) and the Management Indicator Species (MIS) between the DEIS and the FEIS. The results of the analysis are described in the appropriate sections of Chapter 3. Regarding spatial analysis, some is provided in Chapter 3, numerous maps are provided in Appendix F and animations of spotted owl and fisher habitat before and after initial treatment based on Parks & Rojas (2006) are provided on the Sierra National Forest Web site. No substantial changes in our conclusions of cumulative effects occurred between Draft and Final. **Regarding comment 4b:** Specifically in response to this comment, the area considered in determining the cumulative effects of past, present, and reasonably foreseeable activities on fisher is bounded by the San Joaquin River on the north, the Kings River on the south (the boundaries of the HS Ranger District), and the elevation range for fisher on the east and west. **Specifically in response to comment 4c**, a considerable amount of additional analysis were performed for MIS species between the DEIS and the FEIS. Results of that analysis are found in the description of effects for MIS species in Chapter 3 of the FEIS, the **Management Indicator Species Specialist Report – Kings River Project** prepared by John C. Robinson of On My Mountain, Inc., and are summarized below in response to comment No. 18. No substantial changes in our conclusions of effects for MIS species occurred between Draft and Final. **Regarding comment 4d:** The action proposed by the Forest Service is to implement a series of activities to meet the purpose and need for the Kings River Project (KRP). The EIS applies only to the first stage (2006 through 2008) that includes application of the KRP uneven-aged silvicultural system and prescribed fire upon the initial eight management units totaling approximately 13,700 acres. In addition to the site-specific analysis of the eight management units, this EIS includes an analysis of the

	"We are not able to ascertain from the DEIS how much of these chaparral and hardwood acres are slated to conversion…. This information needs to be clearly displayed … and the environmental effects must be further analyzed." - CNPS p. 5, 6, 7 & 9 4g. Concerning *Carpenteria californica*, tree-anemone, in the N_soapro_2 and Providen_4 units: "… the cumulative impacts of the present proposed action over a 30 year period may not be sustainable. These impacts were not addressed anywhere in the DEIS." - CNPS p. 10 4h. DEIS fails to adequately analyze cumulative impacts on sensitive species. - AGC p.9 4i. DEIS should address quantitative monitoring of CE's for MIS in relation to all other similar projects across Sierra Nevada, and should be able to use data collected over past 15 years to ensure viability of MIS if SNF had followed LRMP direction. - Preston p. 11	cumulative effects of establishing 10 management units as no treatment-controls, and the treatment of one unit (South of Shaver) under an existing decision. **Regarding comment 4f:** Conversion of chaparral and hardwood stands to tree plantations is not proposed in either action alternative except for 232 acres of montane chaparral (Table 3-5), some of which may be converted. If all 232 acres were converted, it would be less than one percent of the montane chaparral on the Forest. In fact the KRP uneven-aged silvicultural system retains oaks unless they are a hazard to operations. **Regarding comment 4g:** Additional cumulative effects analysis was performed for sensitive plant species between the DEIS and the FEIS, and a more thorough cumulative effects analysis for Forest Service Sensitive plants can be found in the BA/BE for Threatened, Endangered, and Sensitive Plants. With regard to *Carpenteria californica*, negative effects are not expected to occur as a result of implementation of treatments over the next 30 years. Research on reproductive ecology and response to fire (Clines, 1994; Beyers, Corcoran, and Clines, 2001) indicates that carpenteria recovers and is sometimes benefited by vegetation treatments, including spring burning. The Sensitive Species associated with rock outcrops are expected to be adequately protected, and possibly benefited, by the project, as they have been observed to expand in response to increased light levels (Clines, pers. obs.) The sensitive plant species associated with rock outcrops are expected to be adequately protected, and possibly benefited, by the project, as they have been observed to expand in response to increased light levels (Clines, pers. obs.). The protection measures and requirements to consult with botanists during project implementation are designed to fully comply with the 2004 SNFPA direction to "minimize or eliminate direct or indirect impacts to TES plants…" **Regarding comment 14i:** a considerable amount of additional analysis were performed for MIS species between the DEIS and the FEIS. Results of that analysis are found in the description of effects for MIS species in Chapter 3 of the FEIS, the **Management Indicator**

		Species Specialist Report – Kings River Project prepared by John C. Robinson of On My Mountain, Inc., and are summarized below in response to comment No. 18. No substantial changes in our conclusions of effects for MIS species occurred between Draft and Final.
Commenter	**Comment 5**	**Assigned -Forest Service Response**
Sierra Nevada Forest Protection Campaign (SNFPC) John Muir Project (JMP)	**5. The inverse J-curve bears little resemblance to, and does not reflect to pre-1850 conditions. –** SNFPC p.3 & 54 5a. Violates NEPA by not meeting the purpose and need to identify desired condition for pre-1850 forest structural conditions or natural variation from stand to stand. – SNFPC p.53 5b. Use of Sudworth's data is inaccurate. – SNFPC p.5 5c. J-curve is incompatible with fire resistance and fails to take a hard look at effects of using it for long term fire resiliency. – SNFPC p.55 & 57 5d. DEIS claims to increase density of larger trees (>24"), but would decrease density. – JMP p.1	**Regarding this overall comment and specific comments 5a, 5b and 5c:** See the following letter to Robert C. Heald dated July 17, 2006. **Regarding comment 5d:** One of the Needs described in Chapter 1 is to increase the number of large trees (>35") across the landscape. The Sierra Nevada and the KRP have experienced a decrease in the number of large old trees. As part of restoring the historical pre-1850 forest conditions there is a need to reverse this trend. Large trees are an especially important component of habitat for many wildlife species such as spotted owl and fisher (Verner and others 1992). Maintaining as many large trees in the landscape as possible is important for habitat suitability. The number of large trees across the landscape can be increased by retaining the existing ones and providing adequate growing space in each stand for the medium sized trees. These practices are at the heart of the KRP uneven-aged silvicultural system.
Commenter	**Comment 6**	**Assigned -Forest Service Response**
Sierra Nevada Forest Protection Campaign Attorney General of California	**6. DEIS violates NEPA by not having a reasonable ranger of alternatives. -** SNFPC, AGC, JMP 6a. 2001 ROD must be included as an alternative. – SNFPC p. 57, AGC p.5	Specifically in response to **this overall comment and specific comments 6d, 6e, 6f and 6g**, the Reduction in Harvest Tree Size Alternative (No. 3) was brought forward from the DEIS where it had been eliminated from detailed study to be completely analyzed for the FEIS. Key elements are summarized above in response to comment No. 1. **Regarding comments 6a, 6d, 6e, 6f and 6g:** The Sierra Nevada Forest Plan Amendment

John Muir Project California Native Plant Society, Vivian Parker (CNPS) Californians for Alternatives to Toxics (CATs)	6b. Thinning more in smaller size classes and treating surface fuels was not considered as a fuel reduction alternative. – SNFPC p.58 6c. J-curve is not the only method of achieving pre-1850 conditions. – SNFPC p.59 6d. Analyze models that allow for natural thinning. -AGC p.5 6e. Alternative that would apply the inverse J-curve tree distribution at the landscape scale rather than at the scale of the stand, allowing more dense stands of trees. -AGC p. 5 6f. Improperly dismiss viable alternatives by narrowly defining purposes of the KRP. -AGC p. 6 6g. "The agency must explore a range of alternatives. Furthermore, alternatives must be rigorously explored." - CNPS p. 10 6h. Failure to include a reasonable range of alternatives including one that "doesn't include chemical treatments" – CATs p. 4-10	(2001) was considered as an alternative. It addresses Issue #1: Large tree removal will have adverse effects to old forest dependant wildlife species. However, it was eliminated from detailed study for the following reasons: The 2001 decision specifies an upper thinning limit of 20" diameter and some places less which results in 72 % or more of the growing space in stands where no treatment occurs. So the growing space subject to management would be 28 % or less allowing unplanned events to control the majority of stand structure and processes. It is not possible to say we are practicing uneven-aged silviculture when approximately three quarters of the growing space is removed from managed control and natural forces dictate tree density and composition. So, it does not meet the purpose and need. The 2004 Sierra Nevada Forest Plan Amendment provided the most recent direction applicable to the project when it replaced the 2001 decision. The 2004 decision recognized the ongoing nature of the Kings River Project, and allowed those projects that were approved at the time of the decision to be implemented. So, reconsidering the 2001 decision is outside the scope of this analysis. **Regarding comment 6b:** It is widely agreed that thinning more in the smaller size diameter classes (usually 11 inches or less in diameter) (Omi and Martinson, 2004), (Graham and McCaffrey, 2003) and treating surface fuels would be a viable alternative to reduce the fire hazard (Stephens, 1998), (Graham et al, 2004) if that were the only purpose of the Kings River Project. These actions alone, **do not meet the Purpose and Need.** The underlying purpose of the Kings River Project is to restore pre-1850 forest conditions across a large landscape (Chapter 1). The alternatives considered must also meet the need to gain knowledge of uneven-aged silvicultural systems and prescribed fire (Chapter 1). Thinning the smaller diameter classes (11 inches or less) also termed 'low thinning' or 'thinning from below' is an even-aged silvicultural system and will not test the question as to whether uneven-aged forest

		management can maintain long-term viability of California spotted owl and other wildlife populations, improve forest health and develop a sustainable level of productivity. **Regarding comment 6c:** See the following letter to Robert C. Heald dated July 17, 2006, particularly the 2nd paragraph. **Regarding comment 6h:** Eliminating herbicide use was considered as an alternative. This alternative addresses Issue #2: The use of herbicides/surfactant will create an adverse risk of harmful effects to people and wildlife. However, it was eliminated from detailed study for the following reasons: Where reforestation groups are located in the uneven-aged silviculture stands (mostly existing openings), there is a need to control competing vegetation including: bear clover (*Chamaebatia foliolosa*); manzanita (*Arctostaphylos spp*.); and deerbrush (*Ceanothus spp*). These brush species sprout and are very competitive with conifer seedlings for soil moisture and nutrients because they have deep roots systems and grow in dense stands which prevent other vegetation from being established. Competing vegetation needs to be reduced to less than 20% crown closure around conifer seedlings for a period of 2-3 years following planting (McDonald and Oliver 1984). This effect of decreasing survival and growth with increasing brush cover has been noted by other studies (Powers and others 2004, Wagner and others 1989, Oliver 1984, Fiddler and McDonald 1984, Fiske 1984). It does not meet the need of this project to control noxious weeds using an integrated weed management approach.
Commenter	**Comment 7**	**Assigned – Forest Service Response**
Sierra Nevada Forest Protection Campaign	**7. The impacts of treatments on wildlife habitat are difficult to assess including spatially.** – SNFPC 7a. Fisher home ranges are	**Regarding comment 7 and its sub-parts:** information that spatially and temporally describes the effects of treatments on wildlife habitat may be found in the following locations: Tables in Appendix C of the Terrestrial Biological Evaluation/Assessment provide a pre- and post-treatment (*i.e., immediately*

	not mapped so affect of harvest is unknown. – SNFPC p.9 & 63 7b. Information on habitat immediately post harvest is not provided. – SNFPC p.10 7c. Violates NFMA by not providing baseline data from monitoring to support conclusions regarding MIS so conclusions are not supported by convincing statements of reason which violates NEPA requirement for a hard look. – SNFPC p. 45 & 66 7d. Information on location of treatments in relation to MIS habitat is lacking.	*post harvest*) comparison of habitat for species whose needs are met in the CWHR 3D, 3M, 4D, 4M, 5D, and 5M habitat classifications. This information is further broken down by management units within the project area and displays total acres affected. This information applies to species such as fisher, goshawk, and great gray owl. Pre- and post-treatment comparisons of habitat are also available for selected species analyzed in the FEIS sections for Management Indicator Species (MIS) and migratory birds. Table 2 in the Terrestrial Biological Evaluation/Assessment provides an assessment of effects on the Spotted Owl within Protected Activity Centers (PACs) and within the 1000-acre area surrounding PACs. Table 4 of the Terrestrial Biological Evaluation/Assessment provides a gross comparison of suitable Spotted Owl acres affected for five time periods within the Initial Eight Management Units and also the KRP planning area. Table 5 of the Terrestrial Biological Evaluation/Assessment displays the impacts of the proposed activities on Spotted Owl habitat at the 2500-acre home range scale. A peer-reviewed habitat model is used to predict and describe the effects of the proposed activities on suitable fisher habitat. The model is described in detail in the Terrestrial Biological Evaluation/Assessment's section on fisher. The MIS section of the FEIS provides a summary of effects on avian guilds (riparian, oak woodland, and mixed conifer). This information is displayed by forest type and size/canopy class for both the initial eight management units as well as for all of the 80 management units that occur in the KRP planning area. Additional analysis is found in the MIS section which addresses the relative likelihood that treatments will occur in habitat important to species that utilize riparian, oak woodland, or mixed conifer habitats. For example, of the eight management units included in the proposed action, only three of them contain

		appreciable quantities (e.g., between 100 and 700 acres each) of hardwood/oak woodland habitats: N_soapro_2, Providen_1, and Providen_4. Despite ongoing research in the project area, no fisher dens have been found. Fisher home ranges within the project area are either "known" or "estimated". We met with scientists from the Pacific Southwest Research Station to design the configuration of the KRP Management Units so that they would average 900 acres in size – which is approximately 1/3 the size of a female fisher home range (based on fisher research within the KRP area). Because female fisher home ranges are smaller than male home ranges, no more than 1/3 of any fisher home range is treated. Treatments are designed in both space and time to further reduce impacts on an individual fisher. Treatments are scheduled so that no adjacent Management Units will be treated within a 5-year period (see Tables 8 and 10 in the fisher section of the Terrestrial BE for more information). Between the DEIS and the FEIS, a considerable amount of additional analysis was performed for MIS species. Results of that analysis are found in the description of effects for MIS species in Chapter 3 of the FEIS and are summarized below. No substantial changes in our conclusions of effects for MIS species occurred between Draft and Final. Baseline population data is brought to bear on the analysis of MIS species (see MIS section of the FEIS). Baseline population data for deer, Spotted Owl, other avian species, and fisher/marten resulting from California Department of Fish and Game records, ongoing demography studies, the federal Breeding Bird Survey, and several furbearer studies are described or incorporated by reference into the MIS section of the FEIS. Information on the location of treatments in relation to MIS habitat is described in general terms in the MIS section of the FEIS. Average home range sizes for various bird species were used to further augment and quantify the description of effects to MIS bird species. In large part, treatments will be kept out of meadows and the immediate riparian habitats. The MIS report also found that, because oaks in general are largely unaffected by the proposed action and are generally absent from the planning area, the cumulative effects of implementing the

		proposed action on oak woodland-dependent species are negligible. Detailed descriptions of effects to the habitat of MIS species that are also listed as Sensitive by the Regional Forester are provided in the Terrestrial Biological Evaluation/Assessment.
Commenter	**Comment 8**	**Assigned – Forest Service Response**
Sierra Nevada Forest Protection Campaign	**8. Lack of criteria or plan for how monitoring and research will be translated into changes in proposed treatments. –** SNFPC 8a. No plan to determine the impacts of treatments on fisher. – SNFPC p. 23 8b. Landscape scale monitoring is needed. – SNFPC p.23 8c. Scale of study of fisher is too large. – SNFPC p.23	Specifically in response to **this comment and its sub-parts,** an Adaptive Management Plan has been developed. Included in it is an approach to determining the effects of either of the action alternatives on fisher and to adapt future activities based on the results of monitoring and research informing the NEPA process. The plan can be found at the end of Chapter 2. The approach related to fisher is summarized in the following paragraphs. Our primary objective of the fisher component of this project is to better understand what habitat these animals select/preferentially use within their greater home range and, in turn, how individual fisher respond to changes in habitat that result from both anthropogenic as well as natural influences. All conventional monitoring and research methods for studying this animal have different strengths and weaknesses. Whatever combination of techniques is employed, our intention is to examine fisher habitat in the Big Creek and Dinkey Creek drainage's that include the initial eight KRP Management Units as well as untreated control sites. We will be monitoring fisher activities before, throughout the three major phases of treatments (logging, mastication, prescribed fire), and after treatments to determine fisher use of treated and untreated habitats. These data will be used to analyze use and response and to drive adjustments, as needed, to future treatment of additional management units. Current plans for development and execution of this work include collaboration with the University of California and their efforts to address fisher in their Sierra Nevada adaptive management study that is planned for the nearby Fish Camp area, about 25 miles north of the Kings River Project.
Commenter	**Comment 9**	**Assigned – Forest Service Response**
Sierra Nevada	**9. Soil standards in LRMP are not being met.** SNFPC	The comment is based on a conclusion in the DEIS that soil standard and guidelines are being met without having site specific data for four

Forest Protection Campaign	p.47	management units (n_soapro_2, glen_mdw_1, krew_prv_1 and krew_bul_1). Additional data has been collected and analyzed in the FEIS for these management units (see soils section in Chapter 3). This data characterizes soil condition to determine if the proposed management units are currently meeting soil standard and guidelines and to establish a baseline from which to compare soil condition after the project is implemented. Soil transect data was collected for the glen_mdw_1 and n_soapro_2 managements units and soil pit data and vegetation transect data was evaluated and analyzed in the krew_prv_1 and krew_bul_1 management units. Another part of the comment addressed what our plans are in areas that do not currently meet soil standard and guidelines. Design measures including sub-soiling landings and skid trails and implementing the watershed restoration plans will be implemented to meet soil standard and guidelines. Specifically, sub-soiling will be done on landings and skid trails to ensure that treatment areas will not exceed 15% of the area in compacted soils. In treatment areas where large woody debris standard and guidelines are not being met, prescribed under burning is designed to rarely consume large woody debris. In addition, trees larger then 30" or 35" depending on the selected alternative are being retained and overtime these trees will drop and become large woody debris.
Commenter	**Comment 10**	**Assigned – Forest Service Response**
Sierra Nevada Forest Protection Campaign California Native Plant Society	**10. Assessment of lower Westside hardwood ecosystem is missing. –** SNFPC p.48, CNPS p. 7	Although the Hardwood Management standards and guidelines from page 53 of the 2004 SNFPC ROD were not explicitly re-stated in the DEIS, these S&Gs will be followed and have been incorporated into the planning of the project. Chapter 3, under the Fuels and Fire Behavior section, an assessment of the forest stands vegetation types is described for the initial eight units (see excerpt after the next sentence). Mapping of hardwoods in the KRP project area has been done since the original FIA plots were taken in the 1990s. The DEIS states: **"….** vegetation types and acres are discussed under Vegetation and are displayed in Table 40. Ponderosa pine (28%) and Sierra mixed conifer (43%) are the dominant forest types within the initial eight management units. Forest types that occur less frequently include chaparral (5%), montane chaparral (2%), **montane hardwood (8%),** montane hardwood conifer (3%), red fir

		(3%), barren (7%), and other CWHR types (32%). The KRP uneven-aged silvicultural system retains oaks unless they are a hazard to operations. Conversion of chaparral and hardwood stands to tree plantations is not proposed in either action alternative except for 232 acres of montane chaparral (Table 3-5), some of which may be converted. If all 232 acres were converted, it would be less than one percent of the montane chaparral on the Forest. Plantations or stands of trees with dense shrubs that are encroaching upon the stand and negatively affecting regeneration of such trees are the specific areas mentioned for removal of shrubs or species that compose chaparral types. Some shrubs may dominate the chaparral ecosystem type but also are early-seral stage plants in conifer forests that quickly take advantage of open canopy conditions to establish themselves. In the context of forest units that are specifically planted with tree species or have been managed for tree species, it is only then that these chaparral-type shrubs are removed.
Commenter	**Comment 11**	**Assigned – Forest Service Response**
Sierra Nevada Forest Protection Campaign	**11. Violates NEPA requirement for a hard look by not addressing the potential impacts of the fuel reduction approach.** – SNFPC p.67	In interpreting the effectiveness of fuels treatments (the hard look), the tables in the DEIS may have been misread. Ms Rice in her comments stated that 3149 acres of lop and scatter is scheduled as a fuels treatment. This is true, but one needs to compare the total acres of lop and scatter for each management unit with the total treated areas for each management unit and then look at what other treatments are scheduled to occur. As an example, Bear_fen_6 is a total of 2205 acres and 1275 acres are to be treated as lop and scatter (Chapter 2, Table 8). In Table 9 it shows that 1914 acres are to be prescribed underburned. In the case of this management unit, all lop and scatter acres will be underburned or masticated. Please refer to map package in Appendix F: net fuel treatments and burn treatments for a spatial comparison of how the treatments are placed on the landscape. A comparison of these map layers for each MU will show that all acres to be lopped and scattered will also be treated with either mastication or underburning. We recognize and acknowledge (Fire-Fuel Analysis{FFA} pg 39) that there is a time frame after thinning and before burning that the slash left on the ground could exacerbate the

		fire hazard until such time that the slash is fully treated. The discussion of how natural and activity created slash would be handled was fully discussed in the DEIS and in the FFA. Please refer to pages 4, 9 19 and 40 in the FFA or Chapter 3 for a discussion of maintenance treatments. Tables 8 and 9 in Chapter 2 and the map documents fully illustrate the levels of treatment planned for each management unit, including silvicultural, fuels and prescribed burning. Each MU had a full compliment of treatments to deal with the natural and activity fuels. Ms Rice also stated *that the DEIS and FFA failed to grasp the mounting research evidence that surface and ladder fuel treatments and small tree removal should be the primary focus of land management activities in these fire and vegetation types.* The fire fuels report fully discusses the recent research by such noted individuals as James Agee, Phil Omi, Carl Skinner, Scott Stephens, Erik Martinson, David Perry and Dr. Russell Graham to name a few. Please refer to Chapter 3 of the EIS (Fuels – Fire Behavior) and to the FFA document for discussions on the need to reduce surface and ladder fuels in order to reduce fire intensity. A landscape level analysis has been completed and can be viewed in the FFA. The effectiveness of treatments has been displayed spatially and the full comparison for the first 8 MUs is available in the FFA Appendix B. For a tabular comparison of changes between alternatives refer to the FFA Tables 6 and 9 pages 35 and 43 respectively for fire behavior variables and Tables 10 and 11 Pages 49 and 49 respectively for crown bulk density and wildfire effects. Fire effects were modeled using FVS_FFE and FlamMap for a worst case scenario as is commonly discussed in the current research. Brown, Agee and Franklin (2003) stated "if fuel treatments can reduce flame lengths under worst case fire weather to 1.2 m or less, these forests will survive wildfire well". Perry et al (2004) used fuel moisture conditions corresponding to late-summer drought: foliar moisture 1000%, and 3%, 4% and 6% fir 1-hour, 10-hour and 100-hour fuels respectively. Graham et al (2004) reported that prior small scale fuels treatments in the Haymen fire did little to alter the fire behavior

		during the severe fire weather conditions. Under more benign weather these fine scale forest structural variability (for example stand density and composition) may have altered fire behavior but had little influence on the fire run of 16-19 miles lasting an entire day, and burning 60,000 acres. Graham et al also states that thinning followed with prescribed burning reduces canopy, ladder and surface fuels, thereby providing maximum protection from severe fires in the future. Current research stresses the need to focus on fuels treatments that can effectively alter fire behavior under severe fire weather conditions. The fire weather used in this analysis is the severe weather (97th percentile) for the Kings River Project.
Commenter	**Comment 12**	**Assigned – Forest Service Response**
Sierra Nevada Forest Protection Campaign	**12. Violates NEPA requirement for a hard look because the CWE is not clearly articulated.** SNFPC 12a. Inconsistencies between the aquatics specialists report and TOC's in the DEIS from the ERA analysis. – SNFPC p. 70 12b. Fails to comply with the clean water act so does not meet the requirements for a waiver of waste discharge from the water quality control board. – SNFPC p. 79	**Regarding this overall comment and specific comment 12a:** Between the DEIS and the FEIS, a considerable amount of additional analysis was performed on cumulative watershed effects. The description has been expanded and clarified and the conclusions are presented in both tabular (Tables 3-x, 3-xx, 3-xxx, 3-xxxx, 3-xxxxx) and narrative formats in the watershed section of Chapter 3 and the Hydrologist and CWE Reports in the project record. This work resolved the inconsistencies described in comment No. 12a. This FEIS describes and analyzes implementation of only the initial eight management units so the decision to be made bears only on these management units. The 'inconsistencies' reflect to some extent the difference between the understanding of reasonably foreseeable activities in the DEIS vs. the FEIS. **Regarding comment 12b:** Between the DEIS and the FEIS, technical advice was requested and received from the Fish & Wildlife Service on the fisher and Yosemite toad which are species that are candidates for listing as threatened or endangered. The technical advice (see Appendix D) provided conservation measures for both species. Conservation measures in the technical advice for both species are included as part of the Reduction in Harvest Tree Size Alternative (No. 3). So, the Biological Evaluation determinations for this alternative do not find any species is on a trend toward federal listing or a loss of viability. The additional analysis performed for cumulative

		watershed effects and the inclusion of conservation measures for the Yosemite toad in the Reduction of Harvest Tree Size Alternative, would make the project eligible for a waiver of waste discharge, if the alternative is selected.
Commenter	**Comment 13**	**Assigned – Forest Service Response**
Sierra Nevada Forest Protection Campaign California Native Plant Society, Vivian Parker John Muir Project Californians for Alternatives to Toxics (CATs)	**13. The DEIS fails to meet NEPA informational requirements because:** 13a. The affected environment is not adequately described. – SNFPC p.72 - 76 13b. The project description is inadequate. – SNFPC p.77 - 78, JMP p.1 13c. The DEIS fails to rely or present the best available science. –SNFPC p.78 13d. DEIS fails to adequately describe and divulge uncertainty in historical data regarding tree density in each size class, canopy cover, and basal area. JMP p.1 13e. Inadequate information disclosure – CATs p. 3-4	**Regarding this overall comment and specific comments 13a and 13b:** Between the DEIS and the FEIS, a considerable amount of additional analysis was performed on the habitat and populations of spotted owls and fisher, fire behavior, MIS species and cumulative watershed effects. Results of the analysis are found in the description of effects in the respective sections of Chapter 3, the BA/BE for terrestrial wildlife, the **Fire-Fuel Analysis** and the **Management Indicator Species Specialist Report – Kings River Project** prepared by John C. Robinson of On My Mountain, Inc. In addition, an Adaptive Management Plan has been developed. The plan can be found at the end of Chapter 2. **Regarding comment 13c:** In carrying-out the additional analysis referred to in the previous response, technical advice received from the Fish & Wildlife Service on fisher and Yosemite toad (see Appendix D) and numerous other publications were reviewed and incorporated to assure the best available science was utilized. The bibliography approximately doubled between the DEIS and FEIS. **Regarding comment 13d**: See the following letter to Robert C. Heald dated July 17, 2006, particularly the 2nd paragraph and the 3rd page. **Regarding comment 13e:** CATS complains that there has been a failure of information disclosure in the DEIS. However, it clearly presented and disclosed where treatments are planned in the text of the document starting on page 24. In addition there are over 100 maps in the appendix showing the exact location of all planned treatments including herbicide use. CATS further assert that the information is confusing. By looking at different tables they have found what may appear to be conflicting tables of information. These tables each provide different information and caution should be used when attempts to compare different tables. In there comments to the draft they have professed confusion specifically about the

		following: DEIS Table 7 (page 29) total acres of chemical **treatment** equals 1183 acres DEIS Table 20 (pg 70) foreseeable future actions, **maintenance of existing** plantations with hand, chemical, & mechanical methods equals 2680 acres. The first figure is dealing specifically with the proposed action the second figure is dealing with the maintenance of existing plantations by hand chemical and mechanical methods, not specifically chemical. So the comparison is confusing only because it was misread or applied inappropriately.
Commenter	**Comment 14**	**Assigned – Forest Service Response**
Commenter	**Comment 15**	**Assigned – Forest Service Response**
Attorney General of California Terry Preston	**15. Violates NEPA by failing to comply with FS Manual prohibition against actions that trend toward federal listing.** –AGC p. 12 15a. The LRMP on p. 4 says Forest will ensure sensitive species do not become T or E because of FS actions. KRP "appears to significantly impact" fisher and Yosemite toad, which have become candidates for T&E under the ESA - Preston p. 2 15g. Commits resources to the KRP study design before evaluating reasonable alternatives to the trend toward federal listing or a loss of viability for the Yosemite toad. – AGC p.6-7	Between the DEIS and the FEIS, technical advice was requested and received from the Fish & Wildlife Service on the fisher and Yosemite toad which are species that are candidates for listing as threatened or endangered. The technical advice (see Appendix D) provided conservation measures for both species. In response to other comments as described above, the Reduction in Harvest Tree Size Alternative (No. 3) was brought forward from the DEIS where it had been eliminated from detailed study to be completely analyzed for the FEIS. Key elements are summarized above in response to comment No. 1. Also, conservation measures in the technical advice for both species are included as part of this alternative. So, the Biological Evaluation determinations for the Reduction in Harvest Tree Size Alternative do not find any species is on a trend toward federal listing or a loss of viability.
Commenter	**Comment 16**	**Assigned – Forest Service Response**
California Native Plant	**16. Fails to comply with Forest Plan direction on**	Thorough field surveys for TES plants were conducted by professional botanists at various

Society, Vivian Parker	**T&E species** 16a. Referring to TES plant populations, "…any actions that destroy potential rare plant habitat in the post-disturbance environment or that will result in permanent elimination of post-fire habitat (such as results from reforestation or spring burning that eliminates seed banks), would not be in compliance with this direction." - CNPS p. 12	times of the year for two seasons. The results of these recent surveys, combined with results of past botanical surveys in this same area since the early 1980s reveals a good picture of where TES plants do and do not occur in the initial eight management units. Information also exists on the response of *Carpenteria californica, Lupinus citrinus* var. *citrinus, Mimulus gracilipes,* and *Lewisia disepala* to treatments similar to those proposed in the KRP since the late 1980s. Generally, these species can tolerate or even thrive in response to limited disturbance. With regard to *Carpenteria californica,* negative effects are not expected to occur as a result of implementation of treatments. Any direct effects of the project would be at the request of the botanist to benefit *Carpenteria.* Research on reproductive ecology and response to fire (Clines, 1994) indicates that *Carpenteria* recovers and is sometimes benefited by vegetation treatments, including spring burning (Beyers, Corcoran, and Clines, 2001). The sensitive plant species associated with rock outcrops are expected to be adequately protected, and possibly benefited, by the project, as they have been observed to expand in response to increased light levels (Clines, pers. obs.) in formerly dense forests adjacent to their rock outcrop habitat. Protection measures for TES plants and requirements to consult with botanists during project implementation are designed to fully comply with the 2004 SNFPA direction to "minimize or eliminate direct or indirect impacts to TES plants…"
Commenter	**Comment 17**	**Assigned – Forest Service Response**
Commenter	**Comment 18**	**Assigned – Forest Service Response**
T. Preston	**18. Fails to adequately analyze effects to MIS Avian Guild Species, violating Forest Plan, NEPA and NFMA** 18a. Fails to address impacts to Avian Guild Species, SNF has not identified or monitored 4 avian guilds listed in LRMP. (Preston, p. 3) 18b. KRP will affect riparian	**Regarding comment 18 and its sub-parts:** Between the DEIS and the FEIS, a considerable amount of additional analysis was performed for MIS species. Results of that analysis are found in the description of effects for MIS species in Chapter 3 of the FEIS, the **Management Indicator Species Specialist Report – Kings River Project** prepared by John C. Robinson of On My Mountain, Inc., and are summarized below. No substantial changes in our conclusions of effects for MIS species occurred between Draft and Final. An analysis of direct, indirect, and cumulative effects on the four avian guilds listed in the Sierra National Forest's LRMP is provided in the MIS section of the KRP FEIS. These include the

	guild bird species by decreasing forest canopy and vertical structure around buffer areas will increase risk of "sensitive species" to predation, cowbirds, increasing fragmentation (Preston p. 4) 18c. DEIS conclusions on effects to avian guilds are not supported– SNF has inadequate quantitative data on effects of management on specific species. 18d. EIS does not disclose relationship between logging units and key habitat elements for avian guild species, esp. distribution and abundance. CE's lacking. Preston, p. 5 18e. KRP fails to incorporate monitoring requirements of SNFPA Appendix E (species guilds for Old Forest, Aquatic, Riparian, and Westside Hardwood ecosystems). App. E lists species requiring annual monitoring. Some occur within KRP area and are not mentioned in EIS. - Preston p. 2	Riparian, Oak Woodland, Meadow Edge, and Mature Mixed Conifer avian guilds. The analysis of effects for riparian guild species in the MIS section of the FEIS discloses that "[N]oise from the operation of equipment adjacent to riparian areas may cause intermittent or periodic disturbance to species in these habitats. Birds tend to temporarily move away from noise-generating activities; however, the full effects of noise disturbance are not known and are certainly expected to vary between species. Depending on the timing and location of the proposed activities, nests of some individuals may be disturbed or destroyed. The proposed actions do not increase the amount of grazing activity in the planning area and are therefore not expected to have any measurable impact on cowbird parasitism rates or grazing pressures that may be affecting the target species (Wilson's Warbler, White-crowned Sparrow, Warbling Vireo, and Yellow Warbler)." The analysis of effects goes on to state that many of the project design measures and best management practices that would be part of Alternatives 1 and 3 will "substantially minimize … impacts to fish and wildlife species dependent on riparian and meadow habitats. This is especially true for individuals of riparian- or meadow-dependent species whose breeding and/or foraging areas extend beyond the protection zones described …". In large part, treatments will be kept out of meadows and the immediate riparian habitats. The MIS section of the FEIS brings the United States Geologic Survey's Breeding Bird Survey data and Sierra National Forest-specific habitat trend data to bear on the analysis of effects to avian guilds (riparian, oak woodland, meadow edge, and mature mixed conifer). These data are presented in a quantitative way to: Display the population trend data for the subject species at three different scales (California, Sierra Nevada, and Survey-wide; Display habitat trend data for the subject species on the Sierra National Forest; Displays acres of habitat affected at two different scales (project versus planning areas); and Relate the impact of the proposed activities

		to each species based on its average home range size. The MIS Section of the FEIS contains a number of tables (Tables ## – ##) that display the effects of the proposed action on avian guilds by CWHR forest type, size, and canopy class. In its raw form, these data can also be organized to display effects by management or logging units. During the analysis, the biologist found that effects to the species could be best described by disclosing effects of the proposed action on avian guilds by CWHR forest type, size, and canopy class. In do doing, the impact on distribution and abundance of the subject species is disclosed and cumulative effects are described.
Commenter	**Comment 19**	**Assigned – Forest Service Response**
T.Preston	**19. Fails to adequately analyze effects to MIS other than Avian Guild Species, violating Forest Plan.** 19a. DEIS and MIS report do not analyze direct, indirect, or cumulative impacts to harvest species (Preston p. 5) 19b. DEIS and MIS report do not analyze direct, indirect, or cumulative impacts to osprey - disputes the claims in DEIS and BE about habitat suitability and level of analysis needed (Preston p. 6) 19c. DEIS and MIS report do not adequately analyze direct, indirect, or cumulative impacts to mule deer (Preston p. 7) 19d. Improvement of foraging habitat not balanced with effects of KRP on thermal & hiding cover, increased dispersal distances; holding areas, migration corridors. Population centers	**Regarding comment 19a, 19b and 19c:** Between the DEIS and the FEIS, a considerable amount of additional analysis was performed for MIS species. Results of that analysis are found in the description of effects for MIS species in Chapter 3 of the FEIS and the **Management Indicator Species Specialist Report – Kings River Project** prepared by John C. Robinson of On My Mountain, Inc. No substantial changes in our conclusions of effects for MIS species occurred between Draft and Final. **Regarding comment 19d:** The balance of deer foraging habitat and thermal and hiding cover has been heavy to the latter for decades as a result of fire suppression and the resulting opportunity for in-growth of shade tolerant species like cedar and white fir. Thinning of these species as proposed in the action alternatives would move the balance of deer habitat elements across the KRP in a small way toward a more appropriate mix. Deer holding areas, population centers and winter range and the LRMP standards and guidelines were all considered by the ID Team in crafting stand prescriptions. The GIS coverages and related data used are described in the section titled Other Related Efforts at the end of Chapter 1. **Regarding comment 19e:** One of the adaptations in the KRP from the approach used in earlier projects is that some stands would be single storied but others two or three storied. Each aerial arrangement of tree size/age classes would contain natural openings (meadows, rock, and low productivity site), young reforestation groups, various middle age groups and large

	for North Kings Deer Herd not related spatially in the analysis to treatments and post-treatment habitat conditions (Preston p. 7) 19e. Reduced structural diversity and vertical continuity resulting from KRP treatments will force wildlife species out of treatment areas, and availability of suitable habitat outside treatment areas is not disclosed in DEIS (Preston, p. 11)	trees. Within single storied stands, size and age class is varied providing a mosaic distributed horizontally. Within a multi-storied stand, size and age classes are distributed vertically (one or two under another) as well as horizontally. The landscape would be composed of a mosaic of single and multi-storied stands. The result would be a highly diverse landscape with many different habitat types and nitches.
Commenter	**Comment 20**	**Assigned – Forest Service Response**
T.Preston	**20. Fails to protect, monitor and analyze CEs for willow flycatcher, violating Forest Plan.** 20a. Points out inconsistencies between DEIS and BA/BE and disputes DEIS conclusions about presence of habitat within units and impacts of KRP on that habitat (Preston, p. 9)	Willow flycatcher sites are based on the criteria listed in the Sierra Nevada Forest Plan Amendment, Final Supplemental Environmental Impact Statement and Appendix D Willow Flycatcher Sites in the Sierra Nevada Forest Plan Amendment Planning Area Analysis to support the Supplemental Environmental Impact Statement. Occupied sites are to be surveyed on a four year cycle which is being done on the Forest. As stated in Appendix A. Rationale for Excluding Endangered, Threatened, Proposed, Forest Service Sensitive or Management Indicator Species of the Biological Assessment and Biological Evaluation For the Initial Eight Management Units (2006-2008), there are willow flycatchers in some of the meadows within the management units, however, there are no proposed activities in meadows; therefore, this species will be dropped from further consideration.
Commenter	**Comment 21**	**Assigned – Forest Service Response**
CA Forestry Assoc. Bob Heald	**21. Add clarifying information** 21a. Definition of acronyms, stream classes, watershed codes and fire regimes – CFA 21b. Lettering of the	**Regarding comment 21a:** Definitions of these acronyms has been added to the glossary. **Regarding comment 21b:** Appendix D in the DEIS has been removed from the FEIS to eliminate the confusion. **Regarding comment 21c:** The probability of and affects of catastrophic fire between the

	appendices is confusing – Heald p.1 21c. On the probability and affects of catastrophic fire between the proposed and no action alternatives, especially on emissions, cost of restoration of wildlife and watershed. Also, highlight the compatibility of the alternatives with anticipated climate change. - CFA	alternatives as it relates to emissions is discussed in Chapter 3 of the EIS. Please refer to the section on Air Quality for a discussion on emissions and to the section on Fuels – Fire Behavior for a discussion on the probability of occurrence and fire size of a large severe. Further discussion pertaining to probability and emissions can be found in the Air Quality Determination and the Fire Fuels Analysis (FFA) available upon request from the High Sierra District Office. A discussion on the compatibility of the fuels treatments in light of "anticipated" climate changes is beyond the scope of this analysis. While fire managers and researchers do recognize that a warming of the climate is occurring, the level of increase in temperatures, decrease in humidity's and the corresponding changes in fuel moistures and fire response at the regional level is very complex, to anticipate what level of change may occur in the next decade or two is outside the scope of this analysis. Stephens and Moghaddas (2005a - FFA) state that even for a conservative climate change scenario, it has been predicted that the area burned will roughly double by the end of this century in most western states. Current forest structure and composition in many areas of the western US could be severely impacted in a changing climate that increased drought frequency and corresponding damage from wildfire. The current analysis ran fire scenarios at the current 97th percentile weather in which only 3% of the days have been recorded as hotter and dryer in the last 40 years. If the treatments in the two proposed action alternatives as analyzed and displayed spatially can make a difference in fire type, fire behavior and fire effects, when only three percent of the days are hotter and dryer, then the treatments should effectively reduce fire effects for the next decade as required by the 2004 SNFPA ROD.
Commenter	**Comment 22**	**Assigned – Forest Service Response**
Commenter	**Comment 23**	**Assigned – Forest Service Response**
CA Forestry Assoc. American Forest Resource	**23. Strongly support the Proposed Action** – CFA, AFRC, SAF 23a. The general purposes of the project are most	Thank you.

Council H.S. Chap. – Soc. of American Foresters Bob Heald	appropriate – Heald p.1 23b. Restoration and research goals are compatible – Heald p.1 Correlating the historical vegetation structure with ecosystem disturbance processes is well done – Heald p.1	
Commenter	**Comment 24**	**Assigned – Forest Service Response**
American Forest Resource Council H.S. Chap. – Soc. of American Foresters	**24. Without timber harvest on this and other projects on the Sierra, the Terra Bella sawmill will likely close.** 24a. Removal of the timber needs to be a profitable operation	**Regarding comment 24 and its sub-part:** Especially in light of the August 22, permanent injunction on operation of four timber sales in the Sequoia National Monument, you are most likely correct.
Commenter	**Comment 25**	**Assigned – Forest Service Response**
Commenter	**Comment 26**	**Assigned – Forest Service Response**
San Joaquin Valley Air Pollution Control District (APCD)	**26. This project would contribute to the overall decline in air quality due to:** Operational emissions Construction Activities in preparation of site On-going vehicle traffic	The High Sierra District has prepared an Air Quality Determination as required by Rule 9110, General Conformity adopted October, 1994. Rule 9110 specifies the criteria and procedures for determining conformity of federal actions within the San Joaquin Valley Unified Pollution Control District's air quality implementation. The provisions of Code of Federal Regulations (CFR), title 40, chapter 1, subchapter C, parts 6 and 51 in effect October 20, 1994 are made part of the Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. An Air Quality Determination has been prepared for this project and may be viewed at the High Sierra District Office. It is recognized that emissions will be produced as part of the Kings River Projects. The conformity decision for the Clean Air Act prohibits Federal Agencies from permitting or approving any activity, which does not conform to the State Implementation Plan

		(SIP). An action that requires conformity determination for a specific pollutant will be determined to conform to the applicable SIP if it meets the following criteria: The total direct and indirect emissions from the action is in compliance with all requirements of SIP, and one of the following: 1. The emissions from the action are identified and accounted for in the applicable SIP's attainment or maintenance demonstrations, or 2. The emissions are offset, or 3. Based on air quality monitoring, the actions do not: a. Cause or contribute to any new violation of any standard in any area, or b. Increase the severity or frequency of any existing violations of any standard. 4. State commits to modify SIP in accordance with the EPA rules, 5. Where the EPA has not approved a revision of the relevant SIP, the total emissions do not exceed the historical level (based on the calendar year 1990 or other appropriately agreed to year.) The High Sierra District works closely with the San Joaquin Valley APCD and follows Title 17 Agricultural Burning Guidelines in the completion of a Smoke Management Plan. A Smoke Management Plan will be completed in full for each Management Unit of the Kings River Project. The Kings River Project is exempt from Rule VIII Fugitive PM10 Prohibitions. All activities are above 3000 feet in elevation. Though the project is exempted from Rule VIII an analysis of fugitive dust emissions has been completed as part of an analysis of the cumulative effects of the proposed action. The High Sierra District is part of the Smoke Management Working Group and works closely with APCD to follow Rule 4106 as well as Title 17, and is aware that prescribed burning is potentially a source of nuisance emissions and may be subject to Rule 4102.
Commenter	**Comment 27**	**Assigned – Forest Service Response**
John Muir Project	**27. DEIS claims of tree mortality problems result**	Stand Density Index (SDI) allows for comparisons of tree density between different species and different site quality. The index

	when stand density exceeds 60% are not adequately documented.	compares tree density to a reference maximum density. SDI has been shown empirically to have implications for tree competition for site resources (Rieneke 1933, Drew and Fleweling 1979, MacCarter and Long 1986, Dean and Baldwin 1996). In addition others (Oliver 1995) have described threshold levels for insect attack and tree vigor in the Sierra Nevada. The range in stand density for the transition from endemic insect attack and epidemic insect attack has been identified on the basis of SDI. It is a relative measure of tree density based on the Self-Thinning Rule, also known as the –3/2 rule (Drew and Fleweling 1979) and first described in the Sierra Nevada (Rieneke 1933). "*Very simply, it proposes that all environments with finite resources whether that be a goldfish pond or an acre of ground can support a finite amount of liming biomass. Therefore, as individuals grow in size the number of individuals decline - an intuitive relationship* (Oliver and Uzoh 1997)." Maximum densities have been determined for Sierra tree species based on plot data (Dixon 1994, Oliver 1995). The transition from endemic insect mortality occurs well before the maximum SDI is reached (Oliver 1995, Oliver and Uzoh 1997).
Commenter	**Comment 28**	**Assigned – Forest Service Response**
Californians for Alternatives to Toxics (CATs)	**The use of herbicides to accomplish the desired condition is abusive and unnecessary. –** CATs p. 2 28a. Project need doesn't necessitate herbicide use 28b. Impacts from chemical treatments not adequately analyzed 28c. Lacking integrated pest management alternative for weed control 28d. Failure to analyze opposing scientific views	See the following document titled: Response to CATs comments on the Kings River Project DEIS dated August 21, 2006

Summary of Response to Public Comments
Kings River Project DEIS, Sierra NF

File Code: 1950/2470
Date: July 17, 2006

Robert C. Heald
3300 Lamertiana Lane
Georgetown, CA 95634

Dear Mr. Heald:

Your March 26, letter commenting on the Kings River Draft Environmental Impact Statement acknowledged the appropriateness of the general purposes of the project, the necessity of forest restoration and the excellent description of the historical forest vegetation structure. Thank you. Some of your other comments were perplexing as I will describe in the following paragraphs.

One of your main points is the inverse J-curve proposed for the Kings River Project (KRP) does not represent the historical condition in Sierran forests. The DEIS and supporting documents clearly acknowledges the great variety of distributions present in the 1850: increasing with size, decreasing with size (inverse J-shaped), flat and modal skewed. (DEIS, pages 6 and 139 and Appendix A, item 4). The document recognizes the scientific controversy associated with the nature of the tree distributions found in the historical forest. (DEIS, page 6) While numerous distributions are described in the literature and proposed by others as representative, those with declining numbers with increasing size are most often shown. The description of the historical forest that you complemented clearly describes the uneven-aged structure.

It appears to me, the difference of opinion lies in the representation of the small trees, those less than about 11 inches in diameter. It was not our intent to portray the distribution of trees in reforestation groups or existing groups of small trees with the inverse J-curve, although we were obviously not clear in this regard as a couple of people made comments similar to yours. Our intent was and practice has been to use common spacing standards to control the number of small trees in groups. In the FEIS, our current intention is to use the inverse J-curve to describe the desired distribution of trees between 11 and 35 inches in diameter and to use other means, perhaps only narrative, to describe the distribution of small and large trees. You suggest a set of normal distributions with each one representing one of the ten age classes that would result from the Kings River silvicultural strategy and describe a line drawn through the mid points of the distributions as a downward sloping step function. (Richard Kunstman from the Yosemite Area Audubon suggested a skewed normal Gaussian distribution as describing many natural patterns including “the number of trees in a forest that has developed under natural evolutionary influences”.) We agree that within groups there is probably a normal distribution and at the stand scale they could be represented by a downward sloping step

function. However, at the multiple stand or landscape scale would you not agree the many groups with their variability in age would result in a smooth inverse J- curve distribution and be a reasonable description of the historical forest vegetation structure above 11 inches in diameter? Scale is important. If one looks at only the group of small trees, you may see a normal distribution. If one looks at only a portion of a stand with partial disturbance one might find one of many distributions including the inverse J-curve. However, when one steps back and looks at both the groups of small trees, the partially disturbed areas of stands and the patches of large trees, it is likely an inverse J-curve will be evident, particularly at large scales. This is because groups of small trees that invaded the understory or were created by reforestation fill in the lower end of the inverse J-curve and older trees left after harvest or other disturbance fill in the upper end.

Another main point is the use of normal yield tables is inappropriate to set stand density (basal area per acre) targets for the Kings River silvicultural strategy. As you know, there are no uneven-aged yield tables so the silviculturist must look somewhere else to find guidance on full or normal stand density to utilize in developing stand density or desired basal area targets. As referenced in the DEIS, Foiles (1978) and Curtis (1978) recommend using normal yield tables for this purpose in practicing uneven-age management.

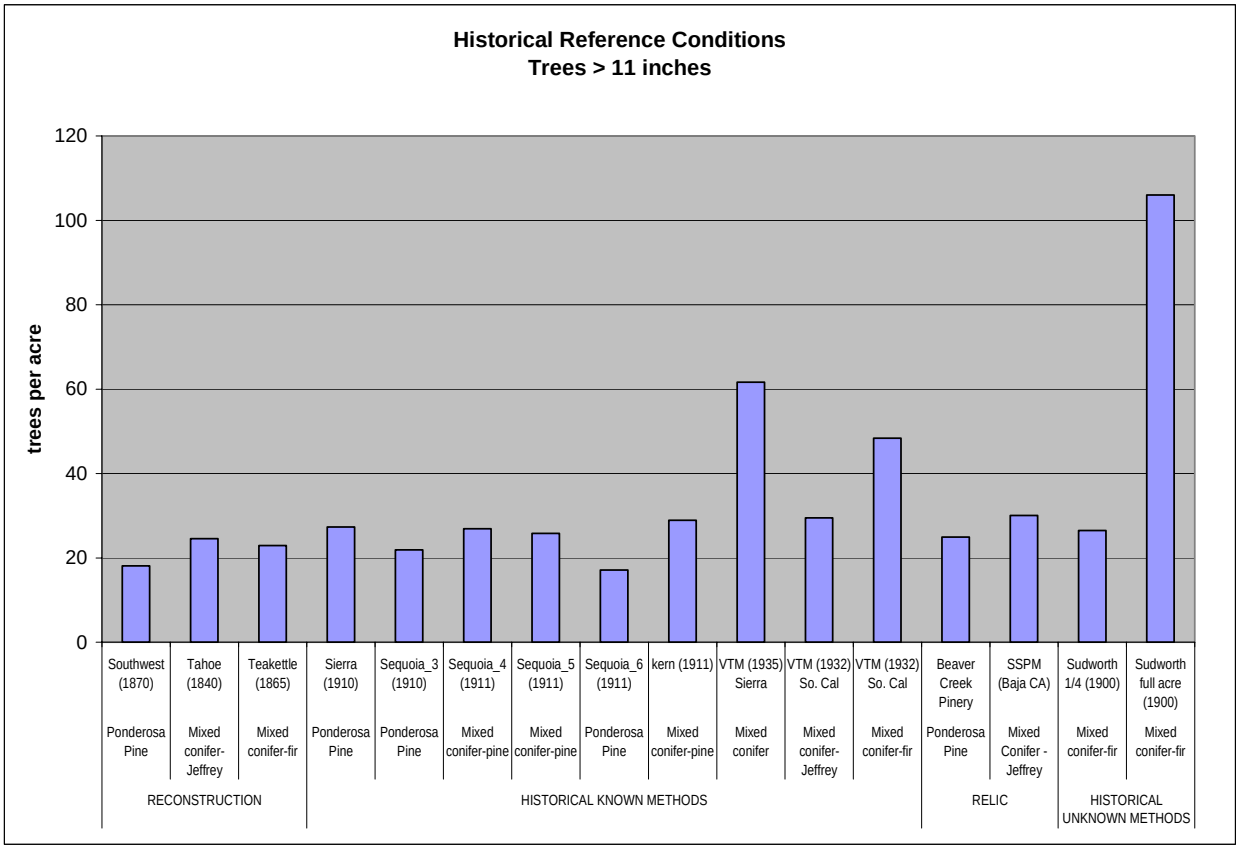
While you wrote a long paragraph on the second page of your letter discussing the appropriate selection of the largest tree diameter to use in developing the inverse J-curve, it is gratifying and important that you accept, on page four, our estimate that 200 years is a reasonable time period to expect to develop large old tree recruitment. We agree any Sierran historical forest has individual trees with life spans of 400 to 600 years so would contain more than three cohorts (age classes) of trees and the Kings River silvicultural strategy describes the expectation of developing ten age classes. (Appendix D, page 2)

Another main point is the inverse J-curve is a result and not a process so its imposition does not by itself create uneven-aged stands or structures representative of the historical forest. We agree that simply imposing an inverse J-curve does not create uneven-aged or historical forest structures. These structures result from partial disturbance, the retention of different existing age classes and the creation of new reforestation groups. The inverse J-curve as defined by the BDQ method is a tool. In the field, application requires choices between species, crown position, age class and size. Crown position requires the recognition of different cohorts in the matrix so that suppressed and intermediate trees are not selected to remain, age class division in the matrix can be accentuated and layering can be developed for wildlife habitat objectives. A minimum basal area target is required to maintain structure and disperse removals across the stand. The J-curve supplies removal or retention targets for the 11 to 35 inch diameter classes. Reforestation groups are created in existing openings and/or groups of small trees are utilized were they exist. Large trees, those greater than 35 inches in diameter, are retained. Prescribed fire is then applied were appropriate and functions as a tool to reduce fuel accumulations, kill small cedar and fir trees and brush and reinitiate frequent fire. The fire is important to the inverse J-curve distribution because it tends to depress the number of small trees in the distribution.

You comment that "allowing up to three acre gaps is likely tantamount to creating an average size gap close to three acres thus clearly out of range with natural gap succession." You must have missed the explanation on page 146 and 147 of the DEIS that reforestation groups would mostly be created in existing openings or areas with low tree density. In addition, the DEIS describes the results of past implementation (DEIS, page 147, Figure 12) of reforestation groups that resulted in most groups less than 1.25 acres. So, most of the gaps exist and are not being created.

Turning now to what you characterize as "perhaps the most egregious . . . mischaracterization of the historic data on large old tress" in the historical forest, your comments epitomize the scientific controversy associated with Sudowrth's 1900 ¼ acre plots. The DEIS recognized this controversy in the literature in Appendix A, item 3 and struggled with how to represent this data set. The literature indicates that these plots were likely biased and also that there is no clear understanding of the methodology used to collect them (Bouldin 1999). In Stephens and Fiske (1998) they narrowly describe the data at the full acre as representative of the sampled acres and not the broader Sierra. In addition, the DEIS looked at many other data sets to determine historical conditions and other literature will be included in the FEIS: existing unmanaged stands at the Teaketttle Experimental Forest, pre-harvest data from the turn of the century and the 1930s (Bouldin 1999, Covington et al 1997, Hasel 1930, Minnich 1995), reconstructed stands (North 2006, Taylor 2003 and others), analogous relic mixed conifer forests at the Sierra San Pedro Martir in Baja California (Stephens and Gill 2005, Minnich 2000), and existing relic Sierran forests not subject to fire suppression at the Beaver Creek Pinery (Oliver 2000). This comparison of data by the most casual observation indicates that Sudworth's data expanded to the full acre does not represent the average historical forest vegetation structure. Following is a graph that displays these various data sources and illustrates the difficulty with using Sudworth's 1900 ¼ acre plots. Since he described the data as representative, observers are left with three options: expand the data to the full acre which is clearly not representative (Stephens and Fiske 1998), only use tree population characteristics of his trees (McKelvey and Johnston 1992), or leave the data unexpanded (Sudworth 1900a). The third option is how Sudworth himself displayed a portion of his Southern Sierra data set in his USGS paper. In the DEIS, we choose to use his data at the population level and as unexpanded ¼ plots. Obviously, we take issue with representing our use of Sudworth's data as egregious and emphasize we did not rely solely on Sudworth to described historical forest structures.

Last, I find your suggestions in the last paragraph on page three and the first one on page four on alternative means of restoring the historical forest vegetation structure to be essentially what we believe was describe in the Kings River silvicultural strategy (DEIS, Appendix 4). It confirms our long standing belief that it is impossible to write enough in an EIS to fully explain to our diverse audiences the scope and details of a project of the magnitude of Kings River. It appears imperative that discussions as in our letters to each other take place out in the forest rather than on paper. So, I extend an invitation to you to visit the Kings River Project during this summer or fall.



Sincerely,

RAY PORTER
District Ranger

Response to CATs comments on the Kings River Project DEIS - August 21, 2006

<u>Project need doesn't necessitate herbicide use (CATs letter, pages 2-3)</u>

Beginning on page 59, the DEIS considered the alternative, ELIMINATE HERBICIDE USE, extensively and addressed all of the points raised by CATs except perhaps when

hand treatments are not effective in controlling noxious weeds so that using herbicides are essential. For example, the DEIS states multiple herbicide treatments are essential where bear clover and other sprouting shrubs exist. Non-herbicide methods of control (hand, fire, animal and mechanical treatments) are ineffective and not feasible (McDonald and Fiddler 1996, McDonald and Fiddler 1997a). Non-herbicide methods for areas of non-sprouting shrubs and grasses are effective. The conclusion in the DEIS is "the alternative was eliminated because prior environmental documents, research, and experience indicate that herbicide application is essential to control sprouting species during reforestation and noxious weed control".

The importance of treating the relatively few and small infestations of noxious weeds at the beginning of a 30 year program of vegetation management is paramount. Because herbicides are considered necessary for successful reforestation, and will be used regardless of the noxious weed problem, including herbicide treatment of the small acreage of noxious weeds is the most efficient and responsible course of action. It is expected that between 3 and 5 years of treatment will successfully reduce the noxious weed populations to the point of needing only follow up hand-pulling each year.

Human Health (CATs letter, pages 11-12)

Sensitive populations (page 11, 2nd paragraph) – As stated in Human Health Risk Assessment (2005), the margin-of-safety approach used in this risk assessment factors in much of the variability in human response. The normal margin of safety (MOS) of 100 is sufficient to ensure that most people will experience no harmful effects. However, unusually sensitive people may experience effects even when MOS values are greater than 100. An individual's susceptibility can be affected by diet, age, heredity, pre-existing diseases, and life style. It cannot be specifically predicted.

The SERA reports for glyphosate report no information from literature reviews to suggest that specific groups such as women and children or individuals are especially sensitive to the systemic effects of the herbicide. There is no indication that glyphosate causes sensitization or allergic responses, which does not eliminate the possibility that some individuals might be sensitive to glyphosate as well as many other chemicals (SERA 2003, 3-51).

General glyphosate toxicity (page 11, 4th paragraph) – The Human Health Risk Assessment (2005) contains a discussion of the potential human health effects from exposure to glyphosate. This discussion is based on the national-level glyphosate risk assessment (SERA 2003). There are no indicators that glyphosate causes neurotoxicity, immunotoxicity, or endocrine disruption (SERA 2002, pages vii to xii). Since 1993 the EPA has classified glyphosate under: "Group E: evidence of non-carcinogenicity for humans." The SERA (2003, page 3-18) concludes "there is no compelling basis for challenging the position taken by the U.S. EPA and no quantitative risk assessment for cancer is conducted as part of the current analysis." Glyphosate tests for mutagenicity have all been negative (USDA, 1995, page 3). The references you provided (Yousef et al

1995, Daruich et al 2001, Heitanen 1983, Peluso et al 1998, El-Demerdash 2001, and Walsh et al 2000) were all considered and referenced in the SERA (2003) risk assessment.

Glyphosate is a potential cause of neurobehavioral defects (page 11, 5th paragraph) – The study by Garry et al 2002 is discussed in SERA (2003, page 3-18) which found it could not be used because of problems in its design. Glyphosate has been extensively tested in mammal acute and chronic exposure studies and as noted in the previous paragraph, it does not cause neurotoxicity.

Roundup is more toxic than glyphosate (page 11, 7th paragraph) – Roundup is not being proposed for use on this project. It has long been known that Roundup, with its POEA surfactant results in greater toxicity to aquatic organisms. The study by Mitchell et al (1987) which you mention involves exposure to fish, which would not seem relevant to human health. Roundup being more toxic than glyphosate to mammals is not supported by the science, as discussed in SERA (2003, pages 3-20 to 3-23). The Sawada et al (1988) reference you provided is considered and referenced in the SERA (2003) risk assessment.

Roundup is a potential endocrine disruptor (page 11, 8th paragraph) - The Richard et al (2005) reference you provided has several problems: 1) It does not support the claim of endocrine disruption; 2) This is an in vitro study using cancerous placental cells exposed to very high doses of Roundup (up to field level application rates of 2%). Dose ranges were from 0.01% (10 parts per thousand) to 2% (2 parts per hundred) which is several orders of magnitudes higher doses than normal in vitro cell tests using pesticides. To find any effect other than mortality of the cell line is amazing. 3) The effect of glyphosate and Roundup formulations at the cellular level is difficult to compare to effects seen at the organism level. At the organism level, there are no indicators glyphosate is an endocrine disruptor as noted in a previous paragraph.

Glyphosate and epidemiology studies and a cancer link (page 11, 9th paragraph, page 12, 2nd paragraph) - From the SERA (2003, page 3-17 and 3-18):

> The human data on the potential carcinogenic activity of glyphosate is sparse. Hardell and Erikson (1999a) reported an increased cancer risk of non-Hodgkin lymphoma (NHL) in individuals in Sweden who have a history of exposure to glyphosate. The increased risk was not statistically significant.

The SERA(2003) also discusses the testing data that indicates a lack of carcinogenicity from glyphosate and EPA's review of the epidemiology data, citing a lack of a definitive cause and effect relationship in these types of studies and the difficulty of relying on unverified recollections of specific pesticide use. At best, these studies indicate a potential for a cause and effect. It is interesting to note that in De Roos et al (2005), the authors mention the previous studies by De Roos (2003), Hardell and Eriksson (1999, 2002) and McDuffie (2001) and state that these studies all have the potential for recall

bias. The De Roos et al (2005) study concludes that they found no definite link between glyphosate exposure and non-Hodgkin lymphoma incidence but found a "suggested association" between glyphosate exposure and multiple myeloma.

Amphibians and Fish (CATs letter, pages 12 – 14)

Herbicide buffers (page 12, paragraph 4 thru page 13, paragraph 5) – Regarding you numerous questions about herbicide buffers to protect amphibians and fish, the Project Design Measures in the DEIS included the following measure adopted from the **SNFPA 2004 ROD Appendix A: Management Direction** for Yosemite toad: no treatments of herbicides/pesticides within 500 feet of the occupied meadows and the following measures were adopted after being developed and found effective on reforestation projects and noxious weed eradication over the last decade on the District:

1. To help protect the soil resources and water quality, within Stream Management Zones established according to BMP 1.8, glyphosate would not be applied except it may be applied within 5 feet either side of ephemeral streams without evidence of scour, if the channel is dry or if water is flowing in the channel, 25 foot on either side.
2. Glyphosate application would not occur between the first frontal storm system after October 15th that results in greater than ¼ inch of rainfall and April 15th of any year to minimize impacts to amphibian species.
3. To avoid affecting non-target plants and aquatic habitats, application of glyphosate would be stopped when wind speed exceeds 5 miles per hour or as soon as drift is visually observed (BMP 5.13).

Roundup has potential effects (page 13, paragraph 6 thru page 14, paragraph 1) – As stated previously, Roundup is not being proposed for use on this project. The study by Relyea (2005) used constructed mesocosms that were populated with wild collections of various freshwater organisms. These mesocosms were then exposed to a single level of glyphosate, in an unidentified formulation that was likely some form of commercially available Roundup product. The study only used 1 dose level rather than a range. The survival of control populations was quite low, which would indicate that perhaps there were other unmeasured confounding factors to survival.

The amount of glyphosate applied to the water was designed to reach a level of 3.8 parts per million. At this level of contamination, Relyea (2005) showed extensive tadpole mortality within approximately 24 hours of the beginning of the experiment. The author, based on existing aquatic studies using Roundup formulations, surmised that the toxic response was primarily due to the surfactant and not the active ingredient glyphosate. SERA (2003) displays data from three studies that used similar formulations (Bidwell and Gorrie 1995, Smith 2001, and Perkins 2000). The Smith study results indicated that the tested amphibian species were somewhat more sensitive than the Relyea study, while the other two showed

results less sensitive than Relyea. So the value of 3.8 is within the range of studies that have been considered in SERA (2003).

The unpublished study by Pan et al (2003) from Oregon DOT, shows that 14 day exposure to Roundup at rates of 10 and 100 ppb reduced periphyton cell numbers but not the level of chlorophyll a. The authors suggest that this is due to a shift in species, rather than an absolute decrease in periphyton numbers. These effects are similar to those outlined for 96 hour studies in SERA (2003) but at dose levels lower than reported for glyphosate (by 1 or 2 orders of magnitude). The longer length of the Pan et al (2003) study is probably the reason for the differences in effect levels. It is highly unlikely glyphosate would be available in a stream environment for such a long time after application, since it binds tightly to organic matter becoming unavailable.

The study by Lajmanovich et al (2003) used Glyfos, a glyphosate formulation with a POEA surfactant. Tadpoles were exposed to establish a 96-hour LC50 of 2.64 mg of Glyfos/L. Malformations were seen at all dose levels (3.07 mg Glyfos/L to 7.5 mg Glyfos/L). The authors suggest that the POEA surfactant is the cause based on known effects to gill-breathing animals. This study is consistent with others discussed in the SERA (2003) and reflects the fact that the POEA surfactant is known to be much more hazardous to aquatic animals than glyphosate. Similarly, the Howe et al (2004) study evaluated several glyphosate formulations (some with POEA, some without) as well as POEA and glyphosate acid against four frog species. This study also found that the POEA surfactant is more toxic than the glyphosate acid, with the formulated glyphosate/POEA products falling in between. Glyphosate formulations without the POEA surfactant had acute toxicities similar to glyphosate acid. Glyphosate formulations with POEA surfactants also caused chronic effects, such as impacts to metamorphosis timing, effects to gonadal development and other developmental impacts at rates of 0.6 and 1.8 mg acid equivalent per liter over 42 days. The authors conclude that the POEA surfactant is the likely cause of these acute and chronic effects to frogs.

Relyea (2005b) is the same study referred to earlier in your letter as Relyea (2005).

The Relyea (2005a) study was intended to see if the addition of predatory cues in addition to glyphosate would increase the toxicity of glyphosate to three species of tadpole frogs. This study used one dose level of Roundup (1.3 mg active ingredient (ai) per liter) over 23 days. This study found that the Roundup alone caused effects to tadpole biomass and survival and adding predators affected the outcome with one of the three species (decreased survival over Roundup alone). The authors agree that the mortality from Roundup is due to the POEA surfactant. There was no effect to algal growth at this rate of exposure.

The Relyea (2005c) study, found one of six species of frog showed some Roundup/predator interaction, with a lower LC50 in the presence of predators (16 day LC50 of 0.55 mg ai/L) than in the presence of Roundup alone (16 day LC50 of 1.32 mg ai/L).

All the Relyea studies involve spraying Roundup over water, which is illegal and violates the label direction. Such an overspray scenario is highly unlikely as shown by the monitoring results noted in the DEIS from 1991 to 2000 of surface water adjacent to projects involving the use of glyphosate on seven projects on the Sierra, Stanislaus and Eldorado National Forests. All resulted in no detections (Bakke 2001).

Water quality (CATs letter, page 14-15)

To understand the likelihood of glyphosate contaminating surface water from sedimentation when it is attached to soil particles, it is essential to consider the entire explanation on page 171 of the DEIS, which follows, rather than just a portion of it as you apparently did.

> Glyphosate becomes strongly attached to soil particles or organic matter on the soil surface or the plant surface. It does not become mobile again with additional precipitation and does not leach through the soil. Because of its very low mobility in soil the only mechanism for off site movement of glyphosate would be if it were attached to soil particles that were eroded and transported to another location. Normal hydrolysis in a stream will not break the attachment of glyphosate to soil particles. So, even if the combination reached the water, it would not be in a form that can be taken up by plants or released through digestion by animals. It would not affect either surface or ground water quality.

The DEIS continues:

> Glyphosate provides a means of vegetation control that causes little, if any, direct soil disturbance. The dead foliage and leaf drop onto the soil surface continues to provide protection from erosion until seeds present sprout. It biodegrades within weeks of application into natural products including: carbon dioxide, nitrogen, phosphate and water. The primary metabolite of glyphosate is aminomethylphosphonate (AMPA). The position taken by U.S. EPA/OPP (2002) that AMPA is not of toxicological concern regardless of its levels in food appears to be reasonable and is well-supported (SERA, 2003, p. 3-25). The half-life of glyphosate can range from 20 to 60 days (SERA, 2003).

Regarding the references provided in the water quality section of your letter, Frans 2004 was incomplete and could not be found, US EPA 1993 states “glyphosate does have the potential to contaminate surface waters due to its aquatic use patterns and through erosion”, Scribner et al (2002) detected glyphosate and AMPA in midwestern streams as you indicate, and various studies have found a different half-life for glyphosate depending on soil type, temperature and moisture content. None of this information causes us to change our determination of the likelihood of glyphosate contaminating surface water from sedimentation or our reliance on SERA (2003) for the appropriate half-life for glyphosate in the Kings River Project.

Soils (CATs letter, page 15)

Reference to Kremer, Agricultural Research Service, USDA (page 15, paragraph 6 thru page 16, paragraph 6) - There are numerous reports of harmful effects of herbicides to microorganisms in laboratory studies. Contrary to laboratory results, most agriculture field studies have shown either no effect or a slight stimulation of soil microorganisms by glyphosate. Because most of the information regarding affects of glyphosate on soil microorganisms comes from agricultural studies including Lotter et al (1999) and Kremer (2003) cited by CATs, a recent study (Busse et al 2001) was conducted to address the effects of glyphosate on forest soils and forest microorganisms. Their findings suggest "that artificial media assays are of limited relevance in predicting glyphosate toxicity to soil organisms and that field rate applications of glyphosate should have little or no affect on soil microbial communities". "Long-term, repeated applications of glyphosate had minimal affect on microbial characteristics despite substantial changes in vegetation composition and growth."

The Sidhu and Chakravarty (1990) reference found "Under field conditions overall effects of herbicide application were less intense. Only 4kg/ha rates of hexazinone resulted in reductions in seedling growth and mycorrhizal infections."

Disturbance, cheatgrass infestation and increased fire risk (CATs letter, page 16-18)

Recently, botanists and ecologists in the Sierra Nevada have observed that certain vegetation management treatments, especially hot prescribed fires, can increase the risk of cheatgrass domination in the coniferous forests of the Sierra Nevada (Keeley, 2006). Fuelbreaks have the potential to favor non-native plant species as well (Merriam et al. 2006). The Forest Botanist has not observed monocultures of cheatgrass forming in Sierra NF mixed conifer forests after disturbance or herbicide applications where canopy cover is not markedly reduced, although data are needed to better understand the potential for invasion by cheatgrass and other weeds. To this end, monitoring for non-native weeds (including cheatgrass) is required for two years after vegetation management treatments (see project design measures for botanical resources and also Appendix B, Monitoring Plan). Most noxious weeds discovered during these surveys will be hand-pulled before they have an opportunity to reproduce, however if there is an expansion of cheatgrass, the opportunity to reduce cheatgrass during post-harvest burn treatments exists.

In addition, field observations after glyphosate applications to control bear clover were made in the mid-1990s (notes in files of Forest Botanist) with the expectation that weedy, non-native plants would dominate the areas of dead bear clover, but this was not the case. Herbarium specimens were made of native herbs that were thriving in the sprayed areas, released from seed bank dormancy by the removal of the bear clover, and similar results have been observed over the years after herbicide treatments and various vegetation management treatments.

Analysis and management of weed vectors including grazing and off-road vehicles is outside the purpose of the FEIS.

Revegetation as a tool in noxious weed management was not considered in the DEIS because the scale of the noxious weed infestations is small and scattered, as described in Chapter 3 and the native seed bank is expected to be more than adequate to replenish the understory.

Integrated Weed Management (CATs ltr, pages 18-22)

IPM is not a control method but a management system. As such, the Proposed Action in the DEIS and the two action alternatives in the FEIS are part of an IPM system. They were designed to meet the requirements of Integrated Pest Management (IPM) and Integrated Weed Management (IWM).

The policy of the U.S. Department of Agriculture and the Forest Service is to implement Integrated Pest Management. IPM is defined as a decision-making and action process incorporating the biological, economic, and environmental evaluation of pest host systems to manage pest populations. One of the benefits of IPM can be the reduction in the use of pesticides, as prevention and monitoring are used to reduce the necessity of direct action. However, IPM is most effective when all the tools potentially necessary are available. Herbicides are one of the tools needed in an IPM program at the forest or watershed level involving vegetation management, including the management of noxious or invasive species.

An Integrated Weed Management program is an interdisciplinary pest management approach for selecting methods for preventing, containing, and controlling noxious weeds in coordination with other resource management activities to achieve optimum management goals and objectives. Methods include education, preventive measures, herbicides, cultural, physical or mechanical methods, biological control agents, and general land management practices, such as manipulation of livestock or wildlife grazing strategies that accomplish vegetation management objectives. Forest Service directives and information on IPM do not reference moving away from any one tool. (FSM 2080.5)

Many of the references provided by CATS define IPM and its components similarly to that stated in the Forest Service Manual (2080.02, 2080.5). Zouhar (2003) recommends that control of cheatgrass should be done “combining physical, biological, chemical, and cultural control methods in some fashion.” Similar statements are made in each of references given by Zouhar (2002, 2004) concerning integrated pest management as they pertain to *Cardaria* species, Klamathweed, and bull thistle. White and Haber (2003) define IPM as “Ecological or Integrated Pest Management involves combining elements of the above four methods (herbicide control, physical control, prescribed burning, and biological control methods) with preventative measures, increased knowledge of the target species biology and ecology, and restoration of the biotic and abiotic components of a habitat before or concomitant with the removal of the invasive exotic.” This statement bolsters the Forest Service’s commitment to using glyphosate and physical

control methods to control or eradicate invasives in the initial eight units of the KRP. Additionally, Andrasick et al. (1996) explicitly state as one of their targets- "Reduce populations of invasive nonnative plants through an integrated pest management program that incorporates chemical, biological, cultural, and physical (mechanical) operations." to combat invasives in National Park lands. DiTomaso's (2001) report on yellow starthistle and its management goes into great detail on control techniques, especially herbicide use and integrated approaches involving two or more components of control methods. Timing of control techniques is important and is considered when planning, as mentioned by CATS when referring to this publication, but it is not necessary to publish such dates in an EIS as multiple factors figure into exact dates of application, including plant phenology, weather, and concurrent project activities. CATS mentions Huckins and Stoll (2004) in regards to herbicide use and its relative gains versus economical or environmental factors. However, Huckins and Stoll (2004) advise the use of IPM and specifically herbicides in conjunction with hand-pulling for small and large patches of Scotch broom. The main point of the article is to ensure that management of Scotch broom is economically feasible and done consistently over several years to ensure control or eradication.

In no article referenced by CATS were specific admonitions given against the use of herbicides, especially glyphosate. Instead, articles mentioned the judicious use of such a method and strongly recommended best management practices when using and applying herbicides, spot selection in lieu of broadcast spraying, utilizing and following material safety data sheets found on chemical packages, the integration of herbicides with other control techniques, and the development of a hazard control plan. These are all practices used by the Sierra National Forest in the implementation of any project using glyphosate or other chemicals. CATS offers good advice concerning the use of IPM and the USDA Forest Service strives to follow IPM principles in every invasive plant control effort conducted on National Forest lands. The Kings River Project intends to use IPM in the fullest sense of the definition in order to restore and approximate conditions found on the forest before European contact, in which reduced populations of invasive plants would be found in the project area. Other articles referenced in the letter were not available (Achuff et al. (1990), Hoshovsky (1986), Pitcher (1986)), referenced in the wrong article and not found (Kedzie-Webb et al. (1996), only available as a general textbook (Thomas, 1986), or generally derived from a much larger work or media that is not specified in the reference (Clark, 2003).

Toxicity information for R-11 (CATs letter, pages 22-23)

The toxicity of R-11 is explored fully on page118 of DEIS and the text follows:

> The only inert ingredient contained in Accord is water. However, the herbicide would be mixed with R-11 surfactant and dye, usually Colorfast Purple. The EPA has categorized approximately 1200 inert ingredients into four lists. List 1 and 2 contain inert ingredients of toxicological concern (Fed. Reg. 54:48314-16). List 3 includes substances such as soaps and List 4 substances such as corn oil, honey and water. Neither R-11 or Colorfast Purple nor inerts included in formulating them are on List 1 or 2.

> There has been concern expressed about the potential for surfactants containing nonylphenol polyethoxylate (NPE)[i], such as R-11, to cause endocrine disruption and other deleterious effects. However, in comparison to natural estrogen NPE is approximately 10,000 to 1,000,000 times weaker in eliciting an estrogenic response (USDA, 2003, p. 9). Based on a planned application rate of one percent R-11, there is no evidence that typical applications of NPE in R-11 will lead to accidental or chronic exposures that exceed the level of concern (i.e. MOS exceeding 100) in workers or the general public. A possible exception would be eye and skin irritation from direct and prolonged exposure through an accidental or mishandling incident where personal protective equipment (eye protection) was not used and first aid was not administered (USDA, 2003, p. v). NPE is classified as slightly to practically non-toxic to mammals and is not mutagenic (USDA, 2003). So, there would be almost no risk to the health and safety of the workers or public from these additives.

To understand the likelihood of glyphosate and R-11 affecting amphibians and reptiles, it is essential to consider the entire explanation on page 87 of the DEIS, which follows, rather than just a portion of it as you apparently did.

> Few studies have been done on the effects of glyphosate formulated as Accord on amphibians and reptiles. We can assume that the effects on amphibians, especially the egg and tadpole stages, are similar to those for fish. There appears to be no systematic differences in toxicity among species when doses of glyphosate are expressed in units of mg/kg body weight. (SERA, 2003, p. 3-6). Also, the Dept. of Fish and Game has studied the effects of the Rodeo formulation of glyphosate (the herbicide plus water) and R-11 on frogs (*Rana pipiens*) and larval flathead minnows (*Pimephales promelas*) in conjunction with testing control strategies for giant cane. The results show glyphosate residues when applied aerially were 10,000 times less than would be necessary to produce acute mortality (Trumbo, 2000).
>
> R-11, the surfactant that would be used with glyphosate, is labeled for application to water and has a history of satisfactory use in aquatic situations by California agencies such as the Dept. of Water Resources and the Dept. of Boating and Waterways. Testing of R-11 has been limited because none is required by EPA and the Dept. of Pesticide Regulation only requires testing on fish and insects. The results of the Dept. of Fish and Game study referred to in the previous paragraph show R-11 residues when applied aerially were 100 times less than would be necessary to produce acute mortality (Trumbo, 2000).

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i The primary active ingredient in many of the commercially available non-ionic surfactants is a compound known as NPE. It is found at rates varying from 20 to 80 percent. NPE is formed through the combination of ethylene oxide and nonylphenol (NP). NP is a

material recognized as hazardous and is included on EPA List 1. (USDA, 2003, p. v) NPE is widely used in industrial applications, detergents, cosmetics, shampoos, surfactants and spermicides.