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Sent via email to: comments-pacificsouthwest-eldorado@fs.fed.us

Re: Comment on the Draft Environmental Impact Statement (EIS) for the Proposed King Fire Restoration Project

Dear Supervisor Crabtree,

These comments are submitted on behalf of Sierra Forest Legacy, the Sierra Club, and the Center for Sierra Nevada Conservation. We have reviewed the **Draft Environmental Impact Statement (DEIS) for the King Fire Restoration Project** and associated documents. In addition, we have attended the public Forest Service King Fire Open House in Placerville and attended four site visits with various staff from the Forest Service, scientists and stakeholders since the fire event. Sierra Forest Legacy is very familiar with this landscape and we have been engaged in fire restoration efforts with the Forest Service since 1992 post-Cleveland Fire Recovery. In 1993 we successfully negotiated increased burned tree retention standards for the Cleveland Fire Recovery area which, to our knowledge, was the first time larger fire-killed trees were left standing for future ecological benefits in the Sierra Nevada. The concept of "life-boating" large ecological structures (large stand snags, large logs) into the recovering forest was a new concept at the time. The Eldorado National Forest should be proud of current and former staff who led the way in supporting what is now a fundamental ecological concept, twenty-three years ago.

The purpose of our DEIS comments is to help inform and influence your final decision to choose a post-fire restoration strategy that provides for ecological integrity, ecosystem resilience, and species viability throughout the restoration process and to ensure that future generations may experience and enjoy a structurally and biologically complex, and ecologically rich post-fire landscape. The DEIS includes several design features that represent small positive steps toward an ecologically sound post-fire recovery strategy; however, in general, we found that the action alternatives do not go nearly far enough to move past the utilitarian-focused post-fire forest management practices that have dominated Forest Service ideology in the Sierra Nevada.

We have several significant issues of concern with your proposal to restore the King Fire landscape:

- None of the proposed action alternatives go far enough to minimize the effects of post-fire restoration activities on the California spotted owl and ensure species viability.
- The proposed action and the fire and fuels modeling analysis did not consider the use of prescribed fire to manage fuels **across the landscape** at any time in the future, despite this being a foundation of our scoping comments and fundamental to restoring mixed conifer forests of the Sierra Nevada forests.
- The fire and fuels modeling analysis, by design, is inherently biased in support of salvage logging.
- The concept of NRV is erroneously being used to justify salvage logging and industrial reforestation, activities that result in forest conditions that have no natural analog and move the landscape further outside of NRV.
- Salvage of low and moderate severity burned forests is unnecessary and antithetical to the concept of forest restoration.
- Reforestation, as proposed, is not economically justified.
- Proposed planting densities are much too high and are not ecologically supportable.
- The use of herbicides in Alternatives 2, 4, and 5 compromise the ecological integrity of the recovering landscape.
- Failure to Provide a Biological Evaluation Violates NEPA's Hard Look Standard.
- The current proposed action violates requirements for a meaningful purpose and need that addresses key issues with scientific integrity 40 CFR §1502.24.
- The current proposed action and alternatives fail to rigorously explore and objectively evaluate a reasonable range of alternatives 40 CFR §1502.14. Reasonable in this context means to adequately consider alternatives that bring together fire-landscape realignment consistent with the best available science and your own specialist recommendations.

Summary of Alternative Supported in this DEIS Comment Letter

The proposed conservation alternative includes significant modifications of Alternative 3 including, 1) increased protections for California Spotted owl, 2) a serious commitment to fire-landscape realignment that mimics the ecological fire regime and fire return intervals known to exist on the King Fire landscape, 3) a reforestation effort, where needed, that moves away from the limited concepts of variable density presented in the DEIS to a system of ecological "cluster" planting based on site conditions and PSW-GTR-220 principles, 4) reforestation efforts that value complex early seral forest conditions and which are coordinated with fire ecologists and fuels specialists to insure planting clusters and planting density support increased fire use, 5) limited to no use of herbicides for reforestation and control of native shrubs, 6) where reduced planting does occur clusters are well-tended to insure creation of first generation fire-recovery forests which become the seed-bearing trees that interact with future fire to provide the ecologically resilient forests of the future.

1. Salvage Logging and Reforestation Compromise Spotted Owl Viability and Persistence on the Forest

We cannot stress enough the level of concern we have for the California spotted owl on the Eldorado National Forest, a species that declined by as much as 61% since 1990 within the project area (Tempel et al. 2014) prior to the King Fire. There is no longer time to let politics, economic interests, or entrenched agency ideology result in further spotted owl declines on your forest. Spotted owls perpetually suffer from management decisions that attempt to "balance" economic interests with species viability and persistence, but these attempts to balance competing interest almost always result in habitat degradation. The time is now to begin making decisions based on the precautionary principle for this imperiled raptor and to arrest the ongoing decline on your forest. Of the alternatives you propose, Alternative 3 would be least harmful to the California spotted owl. However, all of the action alternatives you propose will result in significant adverse effects to spotted owls, including Alternative 3. Therefore, to ensure species viability on the Eldorado National Forest, we believe it is necessary to further reduce the effects of Alternative 3 to this sensitive species.

We thank you for providing the most objective and scientifically accurate NEPA analysis on the potential adverse effects of salvage logging and reforestation activities on the California spotted owl that we have reviewed to date. According to the DEIS, 46 of the 214 (21%) spotted owl PACs on your forest burned in the King Fire, 10 of which were immediately "destroyed"[1] in the fire. You also found that between 21 and 25 of the remaining PACs within the action area, depending on the alternative, are likely to suffer adverse effects caused by many of the restoration activities you propose. Although potential nesting and roosting habitat declined by 60 percent as a result of the fire, the amount of foraging habitat remains unchanged. However, as you disclose in the DEIS, salvage logging, biomass treatments, and reforestation activities would result in the long-term degradation of spotted owl foraging habitat by removing large woody structures and shrubs, important habitat elements for the rodent prey-base on which spotted owls rely. In addition, the salvage of snags within burned forests of low and moderate severity would result in the degradation of nesting and roosting habitat in a landscape for which a significant amount of nesting and roosting habitat were lost during the fire.

It is often proposed that reforestation is necessary to reach fully-stocked desired future conditions sooner than without active reforestation. However, industrial plantation forestry, similar to what is being proposed in the DEIS (i.e., as many as 300 trees per acre are included in planting designs within the DEIS) does not result in multi-aged and multi-canopied forest conditions. The DEIS provides no evidence to support the statements that reforestation densities proposed in the DEIS will result in spotted owl habitat faster than natural forest succession. NEPA requires evidence to support conclusions (40 CFR §1502.24). Because spotted owls are known to select complex early seral forests for foraging (Bond et al. 2009), but are not known to select plantations for foraging, it is reasonable to infer that reforested areas will result in a long-term loss of foraging habitat, compared to the no action alternative. To illustrate this, below is Figure 3V.6 from the DEIS, which was included in the DEIS to demonstrate the results of industrial plantation forestry 50 years after planting on the Eldorado National Forest. Although it is possible to grow trees quickly with industrial forestry techniques, this forest stand is even-aged, with evenly spaced trees, lacks an understory shrub component, and has no large downed woody debris or snags; this forest stand lacks almost all of the important habitat attributes used by spotted owls. Finally, in the SFMZ, you propose to plant trees at densities that will create a shaded fuel break when mature, similar to the stand structure in photograph below. Again, these are forest conditions that do not support viable spotted owl populations and thus should be considered a permanent loss of habitat.

[1] Ten PACs have been removed from the network because it was determined insufficient suitable habitat remained within a 1.5-mile radius of the activity center.

Image above: **Plantation established after the Ice House Fire and managed with herbicide, and pre-commercial and commercial thinning (p. 3-159 DEIS)**

Clark et al. (2012) found that salvage logging interacts with the effects of high severity fire to increase the probability of loss of occupancy and extinction; as such, in the aftermath of a high severity wildfire, the only variable managers have control over to minimize the interactive effect of these two disturbances on spotted owls is to minimize or avoid salvage logging in territories. A primary difference between salvage logging and even-aged management is salvage logging interacts with the effects of wildfire and spotted owls affected by fire are subjected to a second ecological disturbance even within a relatively short period of time (1-2 years). Therefore, we assume that the threshold at which the amount of post-fire salvage logging would result in territory abandonment or reduced reproductive success would be lower than green tree logging. We request the Eldorado National Forest document the need for short and longer term persistence of spotted owls even in landscapes the Forest Service may believe no longer valuable to owls in post-high severity fire. The Forest Service's evaluation of owls currently using burned forests subjected to salvage logging in nesting, roosting, and foraging habitat disregards the immediate risks to the population on the Eldorado National Forest and is not consistent with law, policy and regulations.

Based on post-fire survey results conducted through May 2015, only 16 of the 46 spotted owl territories that burned in the King Fire are occupied. Of the 16 occupied territories, 7 (ELD0001, ELD0042, ELD0051, ELD0085, ELD0206, ELD0216, PLA0080) have more than 50 acres of Forest Service treatments proposed within the territory under Alternative 3, in addition to salvage logging on adjacent private lands. Cumulatively (public and private), of the 16 occupied territories within the King Fire perimeter, on average, 21% (145 acres) of the pre-fire spotted owl habitat in each territory is proposed to be salvage logged under Alternative 3. In other words, on average, 21% of the foraging habitat within each occupied spotted owl territory will be lost to post fire logging and reforestation. The majority of the effects to spotted owls that occur under Alternative 3 are the result of roadside hazard tree removal and the SFMZ. Although it is entirely possible that additional territories will be determined to be occupied by the time protocol surveys are completed over the coming months, the occupancy rate in the King Fire is troublingly low. Such a low occupancy rate suggests the immediate direct effects of the King Fire to the spotted owl population were severe and/or the effects of salvage logging on adjacent private lands over the past 7 months has caused large numbers of territories to be abandoned. Regardless of the cause, such a low occupancy rate makes it all the more important that you maximize the protections you offer to the few territories that remain occupied, otherwise species viability and persistence on your forest would certainly be compromised, **exacerbating the already significant trend toward federal listing**.

Draft Interim Recommendations (IRs) for the California spotted owl, developed a few months ago by Forest Service scientists with the Pacific Southwest Research Station, suggest that no salvage logging should occur within pre-fire PAC acres and no salvage logging should occur within forests that did not burn at high severity. In addition, the IRs call for maintaining 700 acres of foraging habitat within territories. In the absence of final IRs, we suggest you consider following the recommendations in the draft IRs.

To further minimize the effects of Alternative 3 to spotted owls and ensure species viability, we ask that you:

(1) Avoid all salvage logging and biomass removal within all occupied territories, except for hazard tree removal associated with level 3 and 4 roads and salvage logging and biomass removal in the WUI.
(2) Avoid applying herbicides to control native vegetation within occupied territories.
(3) Avoid planting trees at densities that will result in even-aged stands when desired stocking levels are reached.
(4) Avoid hazard tree removal associated with level 2 roads in occupied territories.
(5) Avoid salvage and biomass removal in all pre-fire PACs and pre-fire nesting and roosting habitat within 0.7 mile of an activity center, except for hazard tree removal on level 3 and 4 roads and salvage and biomass removal within the WUI.
(6) Avoid salvage and biomass removal in all low and moderate severity burned forest within 0.7 mile of a spotted owl activity center, except for hazard tree removal on level 3 and 4 roads and salvage and biomass removal within the WUI.

2. Fire and Fuels Analysis is Uninformative and Analytically Biased

There are two fundamental flaws with the DEIS fire and fuels analysis: (1) the analysis does not consider that any fuels management activities will occur within the next 50 years, except for plantation management, despite it being a foundation of our scoping comments that you include the landscape-wide use of prescribed fire as part of the proposed project; and (2) the effects of vegetative regrowth and reforestation on fire behavior were only modeled 10 years into the future, while fuel loads without vegetative regrowth were modeled 50 years into the future, creating results that are inherently biased in support of salvage logging and reforestation.

Although we are pleased to see the inclusion of 2,841 acres of prescribed fire in all of the action alternatives, this is less than 5% of the Forest Service lands burned by the King Fire. We are extremely disappointed that prescribed fire is not being consider more extensively as a management tool to maintain reduced fuel conditions in any areas outside of the Rubicon Canyon within the next 10 years, despite this being a central theme in nearly all current fire science and was the basis of our scoping comments. Nowhere in the document, that we can find, do you address the use of prescribed fire to treat fuel accumulations over the coming decade across the landscape. It appears your view of the purpose of the SFMZs is primarily for fire suppression purposes, otherwise, you would have analyzed the use of the SFMZs as anchors to conduct prescribed fire to treat fuel accumulations in unsalvaged areas in the fire and fuels analysis. In our scoping comments, we requested that you develop and analyze the effects of beginning a long-term landscape-wide fire and fuels management strategy based on the use of prescribed fire to bring about fire-landscape realignment, but you did not include such a plan in spite of the recommendation of your own fire staff. If you had done this, the fuel accumulation models in your fire and fuels analysis would certainly have had different results. There is almost universal agreement among forest ecologists and fire scientists that increasing the pace and scale of prescribed fire in the Sierra Nevada is the only way to reach true landscape resiliency and provide ecological integrity. This was your chance to develop and begin to implement a landscape-wide fuels management strategy. You did not do this or attempt to do this and most of our scoping comments and the literature we cited related to this theme have been ignored.

The DEIS models fire behavior and fuels accumulations 50 years into the future to suggest that salvage logging is necessary, but does not consider or analyze the effects of prescribed fire as a tool to reduce fuels in any area, including the proposed 2,841-acre prescribed fire in the Rubicon Canyon. As we suggested in our scoping comments and as suggested by North et al. (2015), mechanical treatments, in this case, salvage logging, would be most effective if used to establish "anchors" from which prescribed and managed fire could be strategically expanded. Such an idea seems to have been lost from purpose of the SFMZs, for instance, the fire and fuels analysis (page 3-109) offhandedly states, "treated areas under Alternative 3 are not large, nor strategically oriented enough to complement each other or provide sufficient benefit in terms of modifying fire behavior across the larger landscape or greatly enhancing fire suppression actions," and the analysis does not go on to consider the usefulness of the SFMZ as anchor points to increase the pace and scale of prescribed fire across the landscape to treat fuel accumulation and modify fire behavior. If you had included prescribed fire as a method to treat fuels within 10 years, as we suggested in our scoping comments, the fuels and the fire behavior analyses and your conclusions on the effectiveness of the alternatives and the SFMZs may have been considerably different.

We also found that the methods you used to develop your fire behavior models were inherently biased. It is odd that you chose to model fuel accumulations 50 years into the future without the effects of vegetative regrowth or any management activities to reduce fuels, but you did not choose to model fire behavior with vegetation regrowth more than 10 years into the future. It is widely known that industrial forest plantations represent significant fire hazards well into the future, as was demonstrated when the King Fire and Rim Fires burned through many thousands of acres of Forest Service and Sierra Pacific Industries plantations at high severity. Your fire behavior modeling results that project 4-foot flame lengths in all treated and planted areas under Alternative 2 and 4 are at odds with the notion in the DEIS (page 3-105) that in plantations, "the potential for higher fire severity increases approximately five years after planting. Without plantation management, predicted fire severity increases until the trees overtop competing shrubs and begin to self-prune." As we cited in our scoping comments, work by Stephens and Moghaddas (2005) found that in both pre-commercially thinned and un-thinned plantations between 15 and 19 years of age, overall tree mortality from wildfire was well above 80 percent under all modeled fire weather conditions, including 90th percentile weather conditions. According to Sapsis and Brandow (1997), nearly 120,000 hectares of forest plantations in California have never been treated since their initial site preparation and planting of seedlings and these neglected plantations currently have high fire hazards (Stephens and Moghaddas 2005). These papers demonstrate that fire hazard associated with plantations goes well beyond the time at which plantations begin to self-prune and over top shrubs.

It is suspiciously convenient that your fire behavior modeling stopped at year 10, the point when intensive herbicide treatments would no longer be applied to kill brush and shrubs in plantations and fire behavior would drastically change. Such an analysis does not allow for an accurate comparison of the effects of the proposed alternatives on fire and fuels into the future. We ask that you model fire behavior out 50 years with vegetative growth for all alternatives to disclose the longevity of the treatments in altering fire behavior, compared to the no action alternative and to each other. Such an analysis, which considers fire-landscape realignment and mimicking the science-based fire frequency, would substantially contribute to the understanding of the impacts and potentially affect the agency's decision.

The King, Rim, Biscuit, Rodeo-Chediski, Wallow, and dozens of other so called "megafires" that have burned over the past 15 years in the fire-adapted forest of the west indicate to us that **achievement of landscape level resiliency must include the use of wildfire and prescribed fire to achieve ecological benefit**. We call this term fire-landscape realignment (Power Fire Ecological Framework 2015) since the goal is to realign the landscape with its recognized fire frequency and natural fire regime. The current purpose and need emphasize management actions to support a strong fire suppression response, yet a successful long-term strategy for this landscape will not be successful if it relies on the use of suppression. Fire suppression and mechanical fuels treatments failed to halt the King Fire from burning at previously unseen intensity and severity yet the Forest Service seems set to reestablish the same conditions (no large-scale fire strategy, flammable high-density plantations, no response for the 80,000 acres not included in the current proposal that will need fire returned in the next decade), that burned last summer, praying that somehow the outcome will be different when the next fire comes. The King Fire Restoration project is the best opportunity to establish a refined purpose and need to use fire at the landscape scale to achieve appropriate ecological benefits of fire and forest resilience, carbon stability, and improved public safety.

We restate from our scoping comments, the recent scientific literature supports the idea that the mixed conifer forest of the Sierra Nevada were characterized by **frequent mixed severity** fires (Collins and Stephens 2010, Perry et al. 2011). Mixed severity fire includes stand-replacing patches within a matrix of low and moderate fire-induced effects (id). The title of the proposed action is “King Fire Restoration Project.” According to the 2012 planning rule, restoration is defined as: “The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. Ecological restoration focuses on reestablishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystems sustainability, resilience, and health under current and future conditions.” A significant and glaring omission from the purpose and need as it relates to the title of the proposed action is **the purpose and need statements do not include reestablishing the ecological processes necessary to facilitate sustainability, resilience, and health under current and future conditions, in other words, fire-landscape realignment**. In the case of Sierra Nevada mixed conifer forests, that ecological process is unquestionably frequent mixed severity fire, and without it, restoration, by definition, cannot and will not occur.

The long-term fuels strategy should be inclusive of fire and not suggest that treatment areas are solely designed to allow effective fire suppression. Under certain conditions, like those experienced on day four of the King fire, suppression may not be effective or possible. While fire suppression and State mandated homeowner fire clearance (PRC 4291-4299) plays a key role in protecting homes and communities, outside of the WUI, fire suppression and fire exclusion are significant barriers to implementing a large-scale fire and fuels management program (USDA 2011, Ecological Restoration Leadership Intent, p. 2). The forest should recognize the King Fire as an opportunity, both ecologically and economically, to reintroduce fire at a scale appropriate to the Sierra Nevada forests. North et al. (2012) highlights the pressing need to use fire to treat fuels at the landscape scale, stating:

> “With less than 20% of the Sierra Nevada’s forested landscape receiving needed fuels treatments, and the need to frequently re-treat many areas, the current pattern and scale of fuels reduction is unlikely to ever significantly advance restoration efforts. One means of changing current practices is to concentrate large-scale fuels reduction efforts and then move treated areas out of fire suppression into fire maintenance. A fundamental change in the scale and objectives of fuels treatments is needed to emphasize treating entire firesheds and restoring ecosystem processes. As fuel loads increase, rural home construction expands, and budgets decline, delays in implementation will only make it more difficult to expand the use of managed fire. Without proactively addressing some of these conditions, the status quo will relegate many ecologically important areas (including sensitive species habitat) to continued degradation from either no fire or wildfire burning at high severity.”

The majority of the King Fire area has seen little fire in the past century (DEIS 3-53). The yellow pine and dry mixed conifer forests within the King Fire supported frequent fire and display a pre-European fire return interval (FRI) of about 11 years. In other works, these forests evolved with a fire approximately every 9.1 years over the past century (Van de Water and Safford 2011). It is clear there is a need to increase the use of managed fire for multiple resource benefits. The most effective way to increase resiliency and the number of acres treated is to transition away from a suppression dominated and reactionary fire policy and begin implementing a landscape-wide fuels management program that uses fire to mimic natural fire regimes and allow the use of natural ignitions or “free-burning fires” to “regulate fire-induced effects across the landscape” (North et al. 2009). In other words, the best way to limit fire size and uncharacteristic fire effects is when fire burns into recent fires and eventually becomes self-regulating (Falk 2006; Stephenson 1999; Collins et al. 2009).

The Region 5-Sierra Forest Legacy Managed Fire MOU is a positive step in overcoming constraints to implementing a landscape-wide prescribed fire program. On national forests the first step to overcoming these constraints is to plan as though they will be overcome by including landscape plans, staffing and operational capacity necessary to do active burning. A large-scale prescribed fire program is the only option available to perpetually reduce fuels and reduce the economic impacts of mega fires as well as maintain ecological integrity across the landscape and ensure subsequent fires are more likely to burn less severely and within NRV. Consider the result of study on fire reburn severity in Yosemite National Park by van Wagtendonk et al. (2012):

> “Second and third fires reburned larger areas at high severity when the time between fires was nine years or greater, and nearly half of the original high severity areas reburned at high severity. The third and fourth fires did not burn at high severity when the return interval was less than nine years. These changes indicate that the effect of fuel reduction is offset by fuel accumulation over a nine-year period. Fuel accumulations and deposition rates determined by van Wagtendonk and Sydoriak (1987) and van Wagtendonk and Moore (2010) substantiate that nine years is sufficient time for fuels to recover to their pre-burn levels.”

Based on the concept that historic fires limited fire size of current burns, there is an immediate need to return fire to the system within 5-10 years and any delays will have ecological consequences that affect the resiliency of the succeeding forest. The notion that the Forest Service “may contemplate future projects to address ecosystem restoration and resilience such as prescribed fire or additional fuels treatments” is not acceptable. Instead, developing an active (and early) fire restoration program for the King Fire landscape should be the very foundation of this proposed action.

We further note that in the current forest plan Fire and Fuels Management strategy, goals, and standards and guidelines, the Forest Service is directed to “Complete a landscape–level design of area treatment patterns prior to project-level analysis. Develop the treatment **patterns using a collaborative multi-stakeholder approach**. Determine the size, location, and orientation of area fuels treatments at a landscape-scale” (2004 SNFPA ROD, p. 49, emphasis added). The goal of the Fire and Fuels Management Strategy requires a landscape scale approach to result in conditions that permit re-introducing fire into fire-adapted ecosystems. The proposed plantation scheme in the DEIS fails in this regard.

Finally, we ask that you remove all skyline logging from the final decision due to the ineffectiveness of this logging method to reduce fuel loading and because you did not compare the effectiveness of skyline logging in modifying fire behavior to the no action alternative and you did not disclose the cost of skyline logging vs. the timber revenue that would be produced by such an activity. Given that you propose to leave 18 inches of slash and debris scattered throughout cable-logged units, compared to whole tree yarding in ground-based units that leave little slash and debris, one would assume that the potential fire behavior after cable logging would be significantly different than from ground-based logging with whole tree yarding. For instance, studies in the Pacific Northwest found that salvage logging operations that included lop and scatter of branches, limbs, and tops found that small and medium diameter dead woody surface fuels, which actively burn at the fire front and contribute most to fireline intensity, were greater in logged areas than untreated areas in the short term (Donato et al. 2006; McIver and Ottmar 2007) and were predicted to remain higher in these areas for approximately 20 years (McIver and Ottmar 2007). In addition, there were areas that had been cable-logged and then burned in the American Fire on the Tahoe National Forest, these areas had near 100% tree mortality due to high soil heating from logging debris left on site, despite low flame lengths, yet adjacent untreated areas experienced low to moderate fire severity effects.

3. Salvage of Low and Moderate Burn Severities is Unnecessary and Antithetical to the Concept of Restoration

The Forest Service spends millions of dollars a year in the name of creating resilient forest conditions and uses the concept of NRV to justify many actions taken in the name of forest restoration. Despite this, across the project area, Alternative 2 treatments would occur on 4,388 acres considered to be within NRV (DEIS, page 3-256). Tree mortality is a requirement of mixed severity fire, a disturbance regime the mixed conifer forests of the Sierra Nevada are adapted to. There is no debate that all areas burned in the King Fire at low and moderate severity are within NRV. When portions of fires burn within NRV, the resulting conditions are, by definition, “desired.” Desired conditions already met should not require any immediate management action, other than those activities deemed necessary to protect life and property (i.e., roadside hazard tree removal). These areas should be considered “treated” from a fuels and forest restoration perspective, and the only future management activity that should be planned in these areas within the next 10 to 20 years is the use of prescribed fire to maintain resiliency. As such, we ask that you do not conduct salvage logging or biomass removal in any area that burned at low and moderate severity, except for hazard tree removal.

4. Reforestation is not Economically Justified

For ecological reasons, we do not support the exorbitantly high levels of intensive reforestation included in any of the action alternatives. Although we are sure you are already aware of this, we thought it necessary to point out that reforestation activities are the primary driver of the monetary deficits that occur under each action alternative (i.e., if reforestation activities were removed from all of the proposed action alternatives, each would produce revenue, including Alternative 3). Although we are opposed to the high planting densities and high levels of herbicide use proposed in the action alternatives, we are not categorically opposed to reforestation. We do support reforestation methods that attempt to maximize ecological integrity. To us, it is unnecessary to spend millions of dollars to create fire-prone even-aged forest plantations at the expense of ecological integrity and species viability in order to reach fully stocked forest conditions a few decades sooner. Later in these comments, we propose a planting strategy that would better mimic NRV, increase ecological integrity, cost considerably less money to implement, and reach desired conditions sooner than the no action alternative.

5. The Economic Analysis Should be Updated to Reflect Current Timber Values and Mill Capacity

We believe the economic analysis may not reflect the actual current value of the timber; meaning the economic analysis may not accurately represent the ability of the timber to provide revenue that would off-set the costs of the restoration activities. From our experience with the Rim Fire, much less of the timber offered for sale actually sold, and many of the sales that were purchased sold for lower than the Forest Service had predicted in the Rim Fire EIS. As such, we ask that you update the portion of the economic analysis associated with timber revenue based on Rim Fire contracts that actually sold and we ask that you provide transparent mill capacity figures for the mills that are highly likely to purchase King Fire wood, assuming a transportation subsidy will not be provided.

6. The Concept of NRV Does not Justify Salvage Logging or Reforestation

We agree that day-4 of the King Fire likely burned outside of NRV, creating high severity burn patches that would likely not have occurred if not for the past 100+ years of fire suppression and historical logging practices. However, it is irrational to conclude that because a portion of a fire burns outside of NRV it is necessary to implement salvage logging and reforestation practices that create conditions not known in nature. The DEIS suggests that Alternative 3 "maintains larger areas outside of NRV for high-severity patch size than Alternative 2;" however, this is a false dichotomy. It was the King Fire that created high severity patches outside of NRV, not the proposed alternatives; therefore, the appropriate NRV analysis would be to determine which of the alternatives result in conditions that are most within NRV. Alternatives 2, 4, and 5 immediately salvage log, use herbicides to kill native colonizing and sprouting vegetation, and plant trees in a manner that creates dense even-aged forests, all of which create forest structures, forest compositions, species diversity, and species abundance that are not known to occur in nature; therefore it is Alternatives 2, 4, and 5, not Alternative 3, that maintain larger areas that are outside of NRV. All efforts should be made to return the forest to a condition that is consistent with natural forest stands and Alternative 3 is the action alternative that comes closest to doing so.

Rather than homogenizing the forest by planting a carpet of trees across the landscape and using herbicide to kill most anything that gets in the way of tree vigor, we believe reforestation should attempt to mimic naturally regenerating high severity burned forests that burn within NRV. One of the primary drivers of the perception that active reforestation is necessary in areas that burn at high severity and outside of NRV is distance to seed source.

This idea (above) is supported in the Forest Service Region 5 Ecological Restoration Leadership Intent (p.3) which states, "Ensure vegetation and fire management efforts are grounded in concern for biodiversity and ecological process both before and after disturbances like fire."

Since the DEIS fails to recognize and support (support means active fire use) the ecological values of Complex Early Seral Forests, we restate our scoping comments in this DEIS comment letter:

It is important to begin any discussion on CESF with the definition of CESF, and most forest ecologists would agree with the basic principles that CESF is a seral stage in forest development that results when a natural disturbance agent resets successional pathways and the forest is allowed to maintain the full array of legacies (i.e., not subject to post-fire logging or native vegetation control activities) and experience natural regeneration (i.e., not seeded or planted); CESF may be classified as such until trees become pole sized (greater than 6 inches dbh). CESF is among the scarcest habitat condition in many regions (Lindenmayer and Franklin 2002, Noss et al 2006). Compared to logged areas, CESFs are structurally more complex, contain more large trees and snags that originated from the pre-disturbed forest, have more diverse understories, functional ecosystem processes, and more diverse gene pools that, theoretically, should provide greater resilience in the face of climate change than that provided by the simplified early seral forests produced by logging (Thompson et al 2009, DellaSalla et al. 2013). Despite these ecological values, the U.S. Forest Service often determines that the economic value far exceeds the ecological value of CESF. This is clearly illustrated by defining forests that burn at high and moderate severities to be "deforested" and in need of immediate salvage and replanting to recoup the economic value of the timber and to minimize the length of time required for a site to reach old forest conditions. Based on past Forest Service reforestation efforts, there is little to no evidence that intensely reforested and ecologically depauperate areas will survive to reach mature forest conditions (40 CFR§1502.24). Please demonstrate that this re-occurring theme has actually happened in the Sierra Nevada. "In many areas throughout western North America, uncharacteristic stand-replacement wildfires have been followed by reforestation programs that recreate the dense young forests, providing the potential for yet another stand-replacement fires" (Franklin and Agee 2003).

For millennia the primary natural disturbance agent that created CESF in the yellow pine and mixed conifer (YPMC) forests of the Sierra Nevada was mixed severity fire. Many studies suggest that these forests were not characterized by large stand-replacing disturbance events, but rather frequent low and moderate severity events. However, studies on the subject suggest that, on average, 5 to 15 percent of any given fire within Sierra Nevada YPMC would have burned at high severity; and Sierra-wide, approximately 15 to 20 percent of the YPMC would be in an early seral condition (Safford 2013). While we understand that the amount and patch sizes of high severity burned forest within the King Fire are far greater than would have likely occurred under a natural fire regime in an unlogged forest, having too much high severity fire suggests that the amount of moderate and low severity burned forest within the King Fire is far less than would have occurred under a natural fire regime. As mentioned above, there has been little fire on this landscape since 1908 (DEIS 3-53) resulting in high severity effects.

Complex early seral conditions should be supported as a valuable stage of biodiversity and forest evolution, critical to supporting ecological integrity and affirming Forest Service ecological integrity guidance. Plantation establishment and management are counter to supporting ecological integrity and will likely reduce the ability of the forest to respond to climate change with resiliency. The 2012 Forest Planning Rule explicitly spells out the definition for ecological integrity: "The quality or condition of an ecosystem when its dominant ecological characteristics (for example, composition, structure, function, connectivity and species composition and diversity) occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence" (36 CFR § 219.19).

Due to past Forest Service management activities (even-aged management and high-grading) and ongoing even-aged management on private industrial timber lands, there has been a distinct loss of ecological integrity on and adjacent to the King Fire landscape. The King Fire Proposed Action should start the journey to ecological integrity by establishing the process, structure, function, composition and connectivity required for a healthy ecosystem. It is time to abandon the old PLANT-SPRAY (and) PRAY way of doing business.

Natural succession is an ecological process that often begins with fire, and proceeds through multiple stages of forest development, in various degrees throughout the forest depending on fire severity and pre-existing forest composition (Franklin et al 2002). Disruption of this natural process through salvage logging and planting interrupts the natural successional process, and results in reduced biodiversity (Lindenmayer, Burton and Franklin 2008). The cumulative effect (suggested below) that the proposed action would produce must be addressed in the EIS:

> "Habitats and environmental resources appear to be relatively limited in a fully stocked young forest (Spies and Franklin 1991). As a result, species diversity, as well as structural and functional diversity, is probably lowest in this stage of forest development" (Franklin and Spies 1991)

In order to preserve natural ecological processes and biodiversity, many leading forest ecologists today emphasize the importance of naturally evolving early successional forests, noting that they are now the **rarest** type of forest today:

> "Currently, early-successional forests (naturally disturbed areas with a full array of legacies, i.e. not subject to post-fire logging) and forests experiencing natural regeneration (i.e. not seeded or planted), are among the most scarce habitat conditions in many regions" (Noss et al 2006).

> "Young forests growing within a matrix of unsalvaged snags and logs may be the most depleted forest habitat type in regional landscapes, particularly at low elevations (Lindenmayer and Franklin 2002)" (in Brown, Agee, and Franklin 2004).

> "Alpha (species) diversity of both plants and animals is often highest early in succession before tree-canopy closure occurs, lowest in the heavily shaded young forest, and recovers to intermediate as the forest matures and evolves into old growth" (Franklin and Spies 1991).

> "While scientific and management focus has been on the structural complexity of large-stature forests and the habitat relationships of associated organisms, an emerging body of literature shows that a similar or even greater number of species such as songbirds and butterflies are closely associated with the structural and compositional features of small-stature pre-forest vegetation (Betts et al. 2010)" (in Donato et al. 2012).

> “Traditional intensive forest management encouraging prompt reforestation and few legacies is unlikely to approximate the role of naturally generated early-seral conditions” and “Our research, while exploratory in nature, suggests that complex early-seral communities have importance on par with complex late-seral forests in providing habitat for conservation-listed species.” (Swanson et al. 2014).
>
> Swanson et al. (2011) recommend avoiding the certain activities in post-fire proposals: “Natural disturbance events will provide major opportunities for these ecosystems, and managers can build on those opportunities by avoiding actions that (1) eliminate biological legacies, (2) shorten the duration of the ESFEs, and (3) interfere with stand-development processes. Such activities include intensive post-disturbance logging, aggressive reforestation, and elimination of native plants with herbicides.”
>
> “Areas devoted to intensive timber production generally provide little high-quality early seral habitat for several reasons. First, few or no structures from the preharvest stand (e.g., live trees, snags, and logs) are retained on intensively managed sites but are abundant after severe natural disturbances” and “Intensive site preparation and reforestation efforts limit both the diversity and the duration of early seral organisms, which may also be actively eliminated by use of herbicides or other treatments” (Swanson et al. 2011).
>
> “Consequently, many national forest landscapes currently lack sufficient representation of high-quality early seral ecosystems because of harvest, reforestation, and fire suppression policies on both private and public lands (Spies et al. 2007, Swanson et al. 2011)” (in Franklin and Johnson 2012).
>
> “The need to pay more attention to biodiversity issues in plantation design and management is supported by observational, experimental, and theoretical studies that indicate that biodiversity can improve ecosystem functioning, i.e., it is not just the importance of biodiversity per se but its role in improving the overall resilience of the new ecosystem” (Carnus 2006).
>
> “A cautious approach is to increase habitat that is currently rare, or underrepresented compared to active-fire forest conditions, avoid creating forest conditions that do not have a historical analog, and emulate the spatial heterogeneity of forest conditions that would have been created by topography’s influence on fire frequency and intensity” (North 2012).

In summary, post-fire activities that include mastication, seeding, replanting, and herbicides will not improve ecosystem integrity or resiliency in the King Fire region, and may do more harm than good. Restoring non-conifer key components and processes of these ecosystems is essential for full recovery of the habitats and food web dynamics across trophic levels, and restoration of the characteristic fire regime.

We contend there can be no legitimate ecological justifications to salvage log areas that burn within NRV. We also contend there can be no legitimate economic justification to salvage log areas that burn at low and moderate severity given the great lengths the Forest Service goes through to conduct prescribed burns and mechanically treat areas in the name of forest restoration and mimicking the natural disturbance process to which these forest have adapted, mixed severity fire.

7. Effects of Salvage and Reforestation on Listed Species

We would like to emphasize that several listed species occur within the action area that may be affected by project related activities, including the California red-legged frog, Sierra Nevada yellow-legged frog, and valley elderberry longhorn beetle. No project related activities that may affect listed species should commence until you have completed section seven consultation with Fish and Wildlife Service. Once you have completed section seven consultation, we ask that you post a signed copy of the resulting biological opinion or letter from Fish and Wildlife Service concurring the proposed project is not likely to adversely affect any listed species on the King Fire project page of website.

8. Failure to Provide a Biological Evaluation Violates NEPA's Hard Look Standard

According to FSM 2672.1, "Sensitive species of native plant and animal species must receive special management emphasis to ensure their viability and to preclude trends toward endangerment that would result in the need for Federal listing. There must be no impacts to sensitive species without an analysis of the significance of adverse effects on the populations, its habitat, and on the viability of the species as a whole." It has been our experience that the Forest Service provides an analysis and makes a determination on the likelihood of proposed projects resulting in a trend toward federal listing in a Biological Evaluation, released concurrently within draft NEPA documents. In this particular case the Forest Service has sought "alternative arrangements" stipulations from CEQ which further harms our ability to review and comment on potential impacts in the DEIS/BE due to collapsed timeframes. However, in this case, the DEIS and supplementary materials do not provide a written draft determination on the likelihood that any of the alternatives may result in a trend toward federal listing. Although such a determination is required under Forest Service regulations at, FSM 2672.4 and not NEPA, failure to disclose such a determination at this time violates NEPA's hard look standard because you have not disclosed to the public if the restoration activities proposed under any of the alternatives may lead to a loss of viability and increase the likelihood that listing under the federal Endangered Species Act is necessary. This unnecessary time crunch is due to the collapsed timeframes for NEPA review under the "alternative arrangements" agreement requested by the ENF from CEQ. The timing for completion of spotted owl monitoring and full disclosure of site-specific impacts and impacts to the population as a whole are required by law, regulation and policy. An informed decision is critical and should not be rushed. 40 CFR§1500.1 states the fundamental purpose of NEPA which requires information be available before a decision is made and before actions are taken. Important criteria are that information be of high quality, be scientifically accurate, contain expert agency comments and undergo public scrutiny. Complying with NEPA and Forest Service Manual requirements is critically important for species populations trending towards extinction.

The Forest Service regulations a FSM 2672.41 Objectives of the Biological Evaluation include:

1. To ensure that Forest Service actions do not contribute to loss of viability of any native or desired non-native plant or contribute to animal species or trends toward Federal listing of any species.

2. To comply with the requirements of the Endangered Species Act that actions of Federal agencies not jeopardize or adversely modify critical habitat of federally listed species.

3. To provide a process and standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision making process.

The findings of the Biological Evaluation need to be documented in the decision document FSM 2762.4.

The Forest Service Manual direction at FSM 2670.32 Sensitive Species (2) is to review programs and activities as part of NEPA through the biological evaluation process, to determine effects on sensitive species. FSM 2670.32 (3) calls on the Forest Service to “Avoid or minimize impacts to species whose viability has been identified as a concern.” This certainly is the case with California spotted owls on the Eldorado National Forest. Section FSM 2670.32 (3) states that if impacts cannot be avoided, the significance of those effects must be disclosed but **“must not result in a loss of species viability or create significant trends toward federal listing.” (Emphasis added)**

Based on the long-term and significant spotted owl declines that occurred on your forest prior to the King Fire, the effects that the King Fire and/or salvage logging on private lands has had on the occupancy rate of a large number of spotted owls on your forest, and the potential effects of the proposed action alternatives on the few remaining occupied territories within the project area triggers a significant change in direction in the King Fire DEIS. We have proposed several suggestion in our DEIS comment letter we encourage you to adopt.

Finally, we believe that failure to provide a trend toward federal listing determination stemming from the current proposed action and alternatives is a violation of NEPA’s hard look standard, requiring that you prepare a Supplemental DEIS.

9. The King Fire DEIS Limits Fire-landscape Realignment, Violates NEPA and Compromises Heterogeneous Forest Conditions.

According to the law of unintended consequences, “An intervention in a complex system tends to create unanticipated and often undesirable outcomes.”[2] Post-fire salvage logging and reforestation (tree planting coupled with herbicide applications) has become standard management, according to conventional silvicultural practices, despite several decades of evidence that “undesirable outcomes” are almost guaranteed to result, especially in California’s dry, fire adapted interior forests. The purpose and need must address fire-landscape realignment and the lingering impacts of fire exclusion.

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[2] Merton, R. 1996. On Social Structure and Science. P. Sztompka, Ed. Univ. of Chicago Press, Chicago.

Purpose and Need Fails to Provide Actions to Accomplish Stated Objectives.

NEPA 40 CFR § 1502.13 requires disclosure of a purpose and need for action in any EIS. The King Fire Purpose and Need (p. xiii) includes six actions to be pursued by the Forest Service as part of the DEIS. Item #3 is to, "Actively manage severely burned areas to facilitate restoration and resilience."

Contrary to NEPA's requirements to scientific and professional integrity (§1502.24), the Eldorado National Forest has ignored fire use as an early and active management tool that would actually create the long-term resilience sought after in the purpose and need. Trying to describe a vision of resilience that excludes or ignores the primary disturbance process that delivered resilience in the Sierra Nevada for the past 10,000 years (SNEP Vol. II, Section IV; Sugihara et al. 2006; Stephens et al. 2007) is arbitrary and lacks scientific credibility. Further, suggesting that "we'll do prescribed fire in the future" does not hold up under scrutiny. The Peavine Point RNA has had a prescribed burn planned in its perimeter for years (to be implemented in 2010-2011), but never was implemented and tragically burned in the King Fire, mostly at high severity, due to missed fire return intervals and high fuel loads.

The purpose and need fails to identify specific actions and commitments needed to begin a long-term restoration plan. While suggesting resilience in words, actions speak otherwise. In DEIS p. 3-143 &144 there is an explanation of various reasons for why some areas of the King Fire burned:

- "At a Landscape level, the combination of past management activities and fire exclusion had created relatively homogenous areas typified by small trees existing at high densities (Oliver et al. 1996)."
- And at the project level, "Older projects designed under the CASPO Interim Guidelines, implemented 15 to 20 years prior to the fire had little or no follow-up maintenance, resulting in an ingrowth of shrubs and small trees and accumulation of dead and down material trending stands away from desired conditions for fuels management prior to the King Fire."

The explanation above is an honest one but not comforting for those of us thinking that the King Fire's intensity might have jarred the Forest Service out of the old paradigm (very limited fire use, no follow-up maintenance to retain treatment resiliency, and high-density plantation forestry which contributes to high severity effects) (see Stephens and Moghaddas 2005). The Forest Service must move into a new paradigm that includes clumped "cluster" planting in a spatial arrangement supporting resilience, managed for rapid fire-landscape realignment with existing fire regimes and frequencies. By rapid fire return we mean within the 5-10 year scope of this EIS. Fire return intervals should be consistent with the vegetation type, elevation, and topography. The Forest Service has known this fire interval information for a long time and can no longer maintain credibility as a land management agency while at the same time ignoring the primary disturbance process functioning in the Sierra Nevada of the past 10,000 years.

As far back as the CASPO Technical Report (Verner et al 1992) p. 248, the authors stated, ". . . using a conservative mean fire return of 20 years for the 586,000-acre Eldorado National Forest (NF), we would expect a mean of 29,000 acres to burn annually." In fact, only roughly 14,000 acres burned in the 20-year period from 1970-1990 equaling an average of 664 acres/yr.

Now we are commenting on another large fire "restoration" project where no reasonable, frequent landscape fire use in referenced in the DEIS or committed to in the proposed action or alternatives. While recent climate models suggest increased fire activity (Lenihan et al. 2008), and forests trending to chaparral and early seral vegetation, the King DEIS appears non-responsive on how to deal with likely increases in fire activity and the predicted rapid warming currently occurring (Safford 2013). Absent a clear proposal **purpose** of using fire to mitigate future negative fire effects, at the landscape level, the Eldorado NF places its head in the sand by ignoring climate projections. No part of the King Proposed Action takes this landscape toward fire realignment and NRV for fire frequency on this landscape. The 2800 ac Rubicon Canyon burn proposed on the south-facing canyon is mostly hardwoods. While important, this action is a tiny fragment (3%) of the needed fire commitment for the King Fire landscape.

The Power Fire Ecological Framework (Estes and Gross 2015) commissioned by and for an adjacent ranger district on the ENF, analyzed a similar landscape that recently experienced a range of fire effects. The authors are clear about the importance of prescribed and managed fire as key restoration tools for restoring large landscapes. They state, "Fire is an indispensable management tool, capable of doing much of the work to restore ecological processes (Stephenson 1999, Sugihara et al. 2006, North et al. 2012, Meyer 2015)." Referring to steep landscapes such as occur in the King Fire, the authors note that "Prescribed and managed fire has also been identified as the primary means to treat large landscapes particularly in areas where mechanical treatments are limited by access (North et al. 2012)." Since existing and future surface fuels are the primary contributor to fire behavior (Stephens et al. 2009), fire use is key to managing that component of the fuel profile. Managing these forests including Sierra Nevada dry mixed-conifer forests without active fuels management, "will maintain or even increase hazard over the coming decades" (Ibid). The repeated fire return scenario (median FRI 7-12 years, Safford 2013) for these landscapes requires repeated fire entries to maintain fuels treatment effectiveness, especially in the steep King Fire landscape.

Again referring to the Power Fire Ecological Framework (Estes and Gross 2015, p. 19) offer that, "Following large scale fires, an opportunity exists to define a landscape scale strategy to realign fire treatments with an area." These Region 5, Central Sierra Province Ecologists offer that the Forest Service should design a fireshed analysis that includes prescribed fire units based upon fire behavior modeling and expert opinion with 3 major objectives:

1) Reintroduction of fire on a short rotation interval to break up the continuity of post-fire fuels;
2) Maintenance of areas that burned at low and moderate severity within the pre-European fire return interval;
3) To facilitate prescribed fire in projects under previous decisions.

Also cited in the Power Fire Ecological Framework (p. 18), "Recent research has also shown that prescribed fire treatments either before or following plantation establishment can increase the likelihood of survival following a fire (Kobizar et al. 2009)."

None of these critical objectives were specifically called out in the purpose and need for action in the King DEIS. Restoration, recovery and resilience will remain unattainable without realignment of fire with this landscape. This need to "realign" fire treatments with the King Fire landscape is exactly the ecological direction needed to limit the next "mega-fire" and to get this landscape in a fire resilient condition.

There is no escaping this fact that in spite of all the reasons the Forest Service will offer, nothing will override the ecological realities associated with the lack of fire, fuels build-up and the inevitable susceptibility to another landscape fire event. Looking at the facts right in your backyard reveals a situation along the Highway 50 corridor of repeated (mostly human-caused) landscape fires (Wrights, Ice House, Cleveland, Fred's, Kyburz, and now King Fire)--all of which "blew-up" or nearly "blew-up" due to past management and a stunning lack of fire use. Managers are needed who take fire frequency and fire regimes ecology seriously as an ecosystem driver and as a tool that allows actions that give the Forest Service and stakeholders some say in the ecological outcomes on these public lands. Otherwise, as in the King and Rim Fires, high severity wildfire made the choices for us.

The Purpose and Need is wholly deficient under NEPA 40 CFR §1501.1 (d) by failing to identify significant issues for study early on in the process. The weight of all substantial evidence in this project fire record, the work completed in specialist's reports for the project, ecological reports requested by the Eldorado NF for other fire recovery areas, and the preponderance of scientific research in the Sierra Nevada for the past 20+ years cries out for Forest Service managers to take measures to restore fire aggressively and consistent with concepts for fire-landscape realignment. We hope to see significant changes in the FEIS/ROD to address reintroduction of fire at the landscape scale as called out in recent scientific literature and the ecological framework to address fire restoration on the Eldorado National Forest.

Fire history, Fire Return Interval (FRI), and Fire as a Key Disturbance Process is Ignored in the Purpose and Need for action.

Most of the King Fire area has had no fire history since 1908 (DEIS Appendix A, p. 9), with mean FRI of 11 years, or 9 fires in 100 years. In (Appendix C, p.1) former ENF fire staff member Brian Ebert stated plainly that, "Future management strategies need to address the use of fire as a viable fuels management tool (Agee and Skinner 2005; Stephens et al. 2009), a means to achieve large-scale prescribe burning and an important restoration treatment for many ecosystem processes stalled by the absence of frequent burning (North et al. 2012)."

In a recent Op Ed in the Sacramento Bee (7-4-14) titled, *Fire is indispensable for healthy and productive forests*, Regional Forester Randy Moore highlighted the role of fire in the forests of the Sierra Nevada by stating, **"Fire is so important in the Sierra Nevada that it can be seen as medicine for ailing forests"** (emphasis added).

Designing a restoration project of this scale and not including fire as a key, early and frequent component of forest management takes the purpose and need off the mark and fails to address the key problem (fire suppression and lack of fire) by trying to sweep this issue under the rug. It is time for the Eldorado National Forest to "take your medicine" and design a purpose and need that will realign this landscape's fire frequency and fire behavior to be more consistent with NRV, insure resilience, limit dense plantations that thwart fire use and build the scientific integrity lacking in this current DEIS to be consistent with NEPA's requirements to insure professional and scientific integrity (40 CFR §1502.24).

40 CFR §1500.1 (b) requires that information be of high quality and have accurate scientific analysis, with expert agency comments and public scrutiny. NEPA documents should concentrate on the issues that are "truly significant" and not ignore input from scientists, agency experts, and the public regarding the lack of frequent fire in this King Fire area.

Ecological Integrity cannot be obtained by methods that ignore frequent reintroduction of fire. It is misleading to suggest to the public that the purpose and need will "facilitate restoration and resilience" (DEIS p. xiii) at any meaningful scale absent landscape level fire frequency realignment.

10. The King Fire DEIS Fails to Consider an Adequate Range of Alternatives that Address Key Issues Raised in Scoping by Sierra Forest Legacy and by ENF Fire Specialists, Ecologists and Research Scientists.

NEPA requires the Forest Service, based on the information and analysis disclosed in the Affected Environment discussion in the DEIS, to rigorously explore and objectively evaluate all reasonable alternatives (40 CFR §1502.14 (a)). NEPA also requires that the Forest Service devote substantial treatment to each alternative considered in detail (40 CFR §1502.14 (b)). Neither test was met in the King Fire DEIS documents. This is not to say that ecologists and fire specialists didn't disclose information regarding the detrimental impacts of the persistent lack of fire in the project area. They, in fact, did an excellent job of explaining the depth and details of fire history, fire as an ecological process, fire frequency, fire-return interval departure, fire severity class and effects and the need for fire frequency realignment. Evidently, their work failed to sway decision-makers away from a political driven proposal and toward a more science-based approach including increased fire use across the King Fire landscape.

In our SFL-King Fire scoping letter (dated 1-22-15) starting on p.1, we explicitly requested a long-term and fire-centric strategy specifically to address the lingering and often-repeated call for increased fire use in the scientific literature and from your own specialists and their reports, as is required by the governing forest plan. We established that the Sierra Nevada mixed conifer forests are a frequent low-and-mixed severity fire ecosystem (Collins and Stephens 2010, Perry et al. 2011) and that without early and frequent fire this portion of the dry, mixed conifer forest can never reach fire resilience or ecological integrity. This landscape will continue to cycle through larger, damaging, uncharacteristic fires (Stephens et al. 2014, Hurteau et al. 2014).

Consistent with our criticism of the King Fire DEIS purpose and need statement (above) it follows that the DEIS range of alternatives also lacks rigorous examination of issues such as fire use, fire-landscape realignment and a landscape fire reintroduction strategy raised in our scoping letter and by various specialists on the Eldorado National Forest based scores of papers cited in the scientific literature referenced herein.

The King Fire scoping review effort failed to grasp the connected actions proposed in our scoping comments and then proceeded to break out alternatives that effectively disassembled the coherence we strove for in describing a unified approach. First, we recommend a strategy for fire-landscape realignment and a return to management based on the ecological reality of the frequent low-and-mixed severity fire regime and fire return interval. This approach is very similar to the strategies proposed by zone ecologists and fire staff on the Eldorado National Forest (Estes and Gross 2015; King Fire DEIS-Appendix C). Second, we recommended limited salvage logging focused on hazard tree removal, creation of strategic fuels management zones of limited size to support fire fighter safety while allowing rapid reintroduction of fire to support the need to mitigate fire behavior in the south portion of the burn and throughout the King Fire landscape as a whole. Third, we proposed a limited, clumped "cluster" planting reforestation strategy taken after a reforestation presentation by Placerville District Ranger, Duane Nelson. While we support efforts to bring increased variability to any replanting effort, key principles need to be called out specifically.

We ask that the following Landscape Recommendations for Prescribed Fire from the Power Fire Ecological Framework (Estes and Gross 2015, below) be adopted directly into the King Fire FEIS/ROD:

PRESCRIBED FIRE

- Develop a fire strategy which details key locations for managing future fires and facilitating prescribed fire (e.g., ridges that surround logical fire sheds (Figure 8)). This should be completed in conjunction with key forest staff to identify both fire sheds and strategic fire locations where management would be distinct from the general forest.
- In areas, that weren't salvaged, prescribed fire might be a good tool in areas that are too steep to consider mechanical treatments. If these areas burned at high severity, prescribed fire may begin to reintroduce some heterogeneous conditions.
- In fire-prone areas, favor rapid development of fire-resistant stand structures insuring reforestation strategies allow for rapid reintroduction of fire into the burned landscape at various scales.
- Areas that burned at low and moderate fire severity (Figure 12) should be excluded from post-fire treatment (i.e. thinning and revegetation). These areas can be maintained through a robust prescribed fire treatment program to maintain the beneficial effects from the fire.

Recommended Reforestation Strategy

We believe reforestation should attempt to mimic naturally regenerating forests that burn at high severity but within NRV. One of the primary drivers of the management perception that active reforestation is necessary in areas that burn at high severity and outside of NRV is the distance to seed source. Therefore, it only makes sense that the primary purpose of reforestation activities would be to provide a seed source of an appropriate species mix and to use NRV to guide future management decisions.

To better mimic naturally recovering high severity burned forests that burned within NRV, we suggest the following principals be used to guide the reforestation strategy:

(1) Planting small reforestation patches ("clusters") within much larger unplanted stands for the purpose of providing a seed source.
(2) The distance between planted patches would be based on half the seed dispersal distance of the planted trees.
(3) Planted areas (tree clusters and surrounding protection zone) would be intensively managed to ensure tree survival.

(4) Patches would only be planted in areas beyond seed dispersal distance of green forest.
(5) Planting would be limited to sites that a forest is likely to persist into the future based on climate change models.
(6) Use of PSW-GTR-220 principles would include consideration of slope, aspect and topographic position. Site-specific conditions such a cold-pool pockets, moist areas and north aspect would be favored due to higher moisture retention (GTR-220, pgs. 18-21).
(7) Managed fire would be used as the primary management tool reduce fuel accumulations and create heterogeneity.
(8) The successive planting strategies will be directly coordinated with fire ecologists and fuels staff to insure that planting does not impinge on frequent fire return.

We understand such as strategy would require waiting until the planted trees become seed-bearing to reach desired future ecological/stocking levels that include active fire, but our strategy: (1) does not compromise the ecological integrity of complex early seral forests nearly to the extent that the traditional industrial reforestation methods do; (2) would provide for a heterogeneous multi-aged forest; (3) would significantly decrease the time required to reach desired conditions, compared to the no action alternative; (4) if herbicides were proposed (which we do not support), would drastically reduce the use of herbicides across the landscape; and (5) significantly reduce the costs associated with reforestation due to the smaller scale.

The goal in the above strategy would be to: 1) protect the tree clusters to get them to seed-tree stage, 2) not do anything that would interfere with active fire return, and 3) allow active fire and older tree clusters to determine (with the help of an engaged fire and forestry cadre) what the future forest conditions evolve into during climate, forest, weather, topography interactions in the future.

Finally, the King Fire DEIS should disclose the positive fire effects of an enlightened fire-landscape realignment strategy. Some of these positive outcomes include: reduced fuel loads, increased nutrient recycling, biodiversity enhancement, seed scarification, snag and down log creation, opening creation, increased general stand to landscape level heterogeneity, and most importantly reduction of uncharacteristic, high severity fire effects (Silvas 2011).

11. Planting Strategy is "Business as Usual" and will not Provide Variability or Heterogeneity at Meaningful Scales.

"A certified silviculturist can approve (alternative) stocking levels based on a site specific prescription." 1991 *FSH 2409.26b Reforestation Handbook, 4.11a*.

It is not mandatory to meet specific stocking levels if the intention is to improve resilience, restore natural ecological process or respond to new ideas such as PSW-GTR-220 and the implications of topographic influences on sustainable tree densities in an active fire regime. The use of GTR-220/237 heterogeneity principles such as planting in moister areas or cold pool pockets to aid tree survival (PSW-GTR-220, p. 17) is another important concept not considered in the 1991 FSH Reforestation Handbook. The other concern we have regarding the "appropriate stocking densities" is that this Forest Service Handbook is seriously outdated and fails to recognize the recent positive changes in forest management including: concepts of ecological integrity, sustainability, wildlife viability, complex early seral forests, fire return interval, etc., that evolved since the unfortunate days of old-growth high-grading and large scale clear-cutting which ended in 1993 thanks solely to the new protections for the California Spotted owl instituted by the Forest Service-PSW Regional Office. Uniform stocking densities and dense tree spacing is a hold-over from the plantation forestry days when the Forest Service was focused heavily on wood fiber production at the expense of ecological integrity.

How do you judge fire resilience and reforestation success?
The Forest Service needs to explain the methods and metrics for judging success as you appear to be replicating the very same reforested conditions (dense planting and fire exclusion) that have led to recent fire events on the ENF. These are economically and ecologically costly events that strain our ecological, social and economic capacity to cope with landscape high severity fire events. Repeating the same strategy and expecting a different result is . . . hard to defend. See (below) the photo collage of previous failed plantation efforts on the Eldorado National Forest directly adjacent to the King Fire and the Highway 50 corridor.

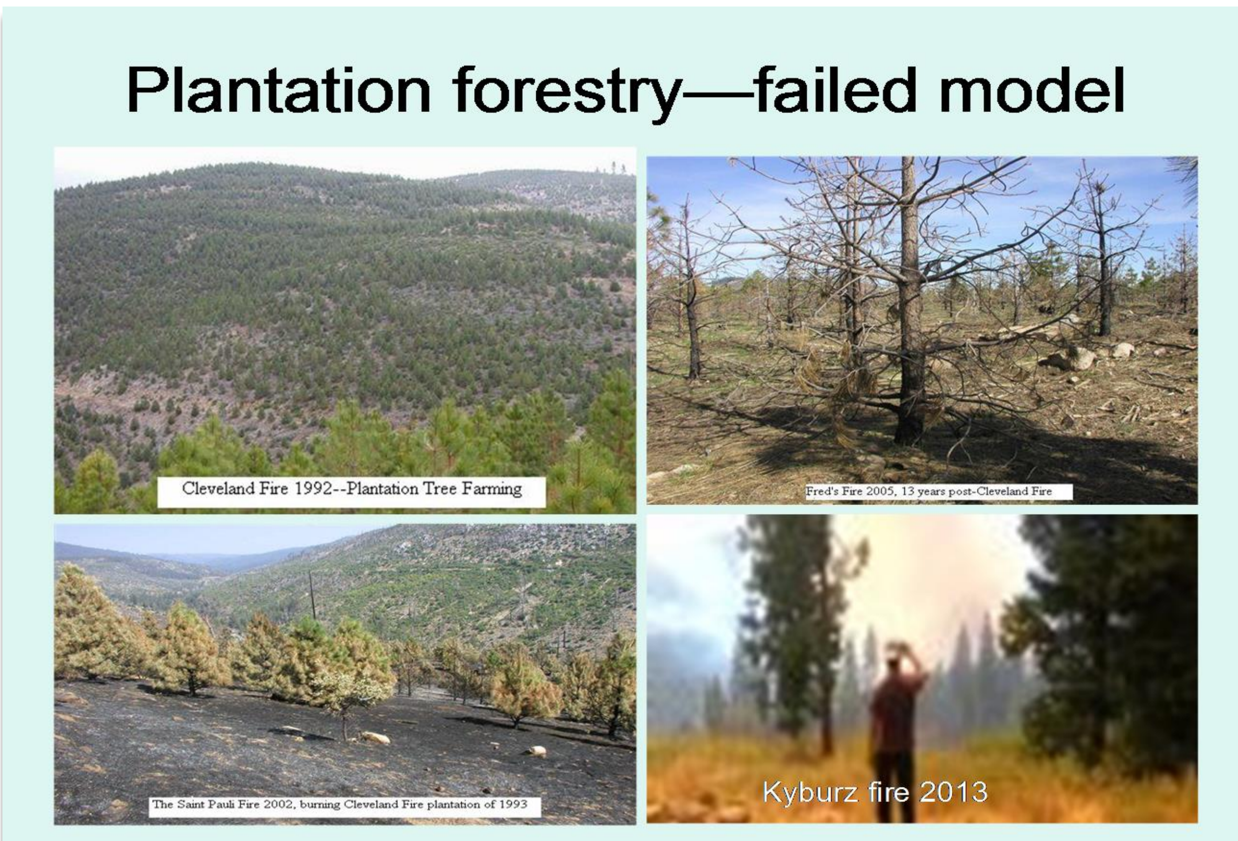


Image above: Plantations on the Eldorado National Forest

The DEIS strategy for heterogeneity is a passive approach that is poorly defined and lacks an active effort to create variability and resilience in an active, frequent fire regime.

In a general sense, using the words “variable”, “clumping” or “GTR principles” for designing any forest management strategy absent explicit definition of what is being planned violates the intent of NEPA for scientific integrity and accuracy. Dense planting techniques, historically left untended until the first commercial harvest, are not the equivalent of a scientifically sound tree-cluster distribution strategy that actually supports fire use versus thwarting fire use due to high-density planting (150-200 TPA) and high investment. Variable planting approaches characterized in the DEIS p. 3-156 are simplistic and are not informed by recent research such as (Lyderson et al. 2013, North et al. 2012) or the thoughtful work in the Power Fire Ecological Framework (Estes and Gross 2015, Table 9, p.23)

The tendency to over-stock is apparent from past actions on the El Dorado National Forest and are being repeated again based on statements in the DEIS 3-156. The “variable” planting strategy is simply an area avoidance strategy where “snag patches” and “other areas avoided during site-prep” would not be planted. Similarly, stating that areas of future mortality would be replanted absent understanding the climate signal that such mortality represents demonstrates the lack of a thoughtful, coherent long-term vision for this area.

If snag retention areas are appropriate to plant (example: complex early seral habitat is abundant and conifer seed sources are a long distance from the site), planting in snag patches may be appropriate. If worker safety is an issue (as claimed on a recent King Fire field trip) then why are wildlife staff, researchers and monitoring crews regularly entering these areas to conduct survey work on a daily basis?

The DEIS reforestation approach is not the thoughtful, site-sensitive, topography-responsive, fire-sensitive clumping or cluster-planting strategy we were recommending in our scoping letter nor is it consistent with intentional forest management that claims to be adopting GTR-220 heterogeneity principles. Instead we read that site stocking levels in the 1991 FSH 2409.26b Reforestation Handbook are “minimum and recommended” levels of trees per acre (DEIS 3-157) and that 150-200 trees per acre are “needed to establish a growing forest.” A different strategy or density would not be a “growing forest?”

Please explain why the 2015 Power Fire Ecological Framework (PFEF), written and well-referenced by Forest Service Province Ecologists, is only recommending planting more than 150 trees per acre on moister, lower slope environments (PFEF p. 23)? With this high level of over-stocking in the proposed action the Forest Service will insure that fire exclusion due to plantation fire risk in dense plantations and investment cost risk will once again limit fire use in this landscape, and will once again be cited as part of the list of causes for why this landscape burned with high-severity effects in the next fire.

Unless there are serious changes in the reforestation strategy including additions of staged[3] cluster planting and rapid fire return we will have a “business as usual” planting strategy that will not accomplish the purpose and need, nor will it respond to NEPA’s requirements for rigorous examination of reasonable alternatives.

[3] By staged we mean reforestation that continues as needed in 5-10 year cycles based on periodic needs assessments and also based on fireshed planning and Rx fire entries. Staging also insures the continued coordination necessary to prevent large-scale dense plantations from thwarting fire-landscape realignment efforts.

Image above: From D. Nelson PPT presentation. This is not business as usual. SFL contends that cluster planting allows fire in openings when clusters are well-tended (fire-proofed essentially to develop seed tree age).

12. Fred's Fire Ecological Report Fred's Fire Seedling Survival Raises Questions Regarding Reforestation Needs and Impacts from Multiple Herbicide Applications.

The *Inventory and Monitoring of Current Vegetation Conditions, Forest Stand Structure, and Regeneration of Conifers and Hardwoods throughout the Freds Fire Burn Area* (Bohlman and Safford 2014) (hereafter Fred's Fire Report). The report looks at various post-fire ecological responses in the 7,700 acre 2004 Fred's Fire, a partial reburn of the past Cleveland, Wrights, and Ice House fires and is directly east of the King Fire perimeter on the Eldorado National Forest. Data is from stand exams and regeneration plot information collected during 2009, 2012 and 2013 field seasons.

Important information from the Freds Fire ecological assessment includes:

- Overall medium seedling density was 285 seedlings per acre which is above Forest Service target stocking rates for mixed conifer forests.
- Yellow pine seedling density peaked in plots burned at moderate severity.
- Pinus and Quercus ssp. both exhibited an annual survival rate from 2009-2012 of approximately 70%.
- 2012 shrub cover showed no relationship with seedling survival but 2009 shrub cover showed a positive relationship, indicating that higher shrub cover early on (5 years post-fire) may positively impact seedling survival (especially oaks) 3 years following fire.

- The amount of coarse woody material and fine fuels in burned plots averaged 10.8 tons per acre.
- Non-native species richness was highest in in the highest fire severity classes.

Overall this report raises serious questions regarding the need for active planting in the King Fire perimeter. With medium seedling densities at 285 seedlings per acre and 1,619 seedlings per acre in moderately (50-75% BA mortality) burned areas, 849 seedlings per acre in higher intensity areas (75-90% BA mortality) and 202 seedlings per acre in the highest fire severity class (>90 BA mortality), it calls to question the need for intensive reforestation on the 11,561 acres to be replanted under Alt. 2 in the King Fire DEIS.

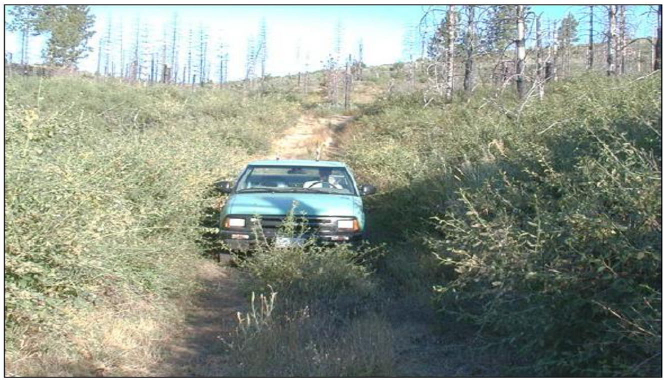
With yellow pine seedling density peaking in the areas burned at moderate severity, this result tracks with the outcome expected from the natural fire regime of mixed severity fire in dry, mixed conifer forests. There should be no salvaging in low-moderate burns in the King Fire since these fire effects should be thought of as a **treatment** and not a problem to be somehow fixed.

In the report, early shrub cover was found to increase seedling survival in the first critical 3 years post-fire. After year 3 no trend was shown (Fred's Fire Report p, 12). Shrub species contribution to conifer seedling survival coupled with thoughtful management (predominantly with frequent fire and hand tools) of selected "clusters" of free-growing or planted seedlings is what we have recommended in our DEIS comments. This strategy is most consistent with the NRV with active fire which should be the King Fire desired condition.

A further concern is the presence of high levels of non-native species that is likely due to repeated selective herbicide treatments in the Fred's Fire perimeter and unprecedented level of non-native grasses and weeds due to lack of fire and heavy herbicide use for reforestation. This situation seriously complicates reintroduction of fire into this landscape and should not be repeated in the King Fire restoration effort. As we said in our scoping letter, page 14, herbicides are known to increase the prevalence of flammable grasses (Rinella et al 2009, McGinnis et al 2010). McGinnis et al. 2010 found that herbicide-treated areas have more alien grass and forb species than areas with high shrub cover" (McGinnis et al 2010), and the presence of dense flammable alien grass puts young conifers at risk from fire (Weatherspoon and Skinner 1995), and demands fire suppression to protect them. Countering this effect with additional herbicide usage to reduce the grasses leads to a scorched earth landscape supporting nothing but conifer crops, essentially useless for wildlife, and exactly the model practiced by Sierra Pacific Industries. The EIS must address this issue using the available evidence and science we have provided.

13. Assumptions in the DEIS about Natural Regeneration are Arbitrary and Biased

We take exception to the photo on p. 3-151 3V.4. The Cleveland Fire photo is the "old chestnut" the Forest Service troops out to demonstrate to the unsuspecting public a version of "passive" management supposedly making some poorly defined case for massive salvage logging projects followed by multiple toxic chemical applications and industrial tree farm plantations. This "plant, spray and pray strategy" is not only profoundly unsuccessful as demonstrated by recent fires cited above, it is economically costly to taxpayers even if offers "make work" opportunities for the Forest Service, and it is an ecologically outdated forest management strategy.



What we actually see across the whole of the King Fire landscape is near total exclusion of fire, the primary ecological process operating in this landscape. We see the dramatic loss of large old growth trees from a century of logging which will take centuries to repair, at-risk wildlife species in serious population declines (mentioned above) and costly, sterile and fire prone plantation forestry still capturing the minds of the next generation of foresters.

Below is another picture of the same 1992 Cleveland Fire event showing a biologically and structurally diverse landscape that has experienced little or no active management since the ignition date. This is a rich, complex and vibrant landscape which should also be represented in any honest discussion of the effects of management. NEPA 40 CFR §1502.24 requires professional and scientific integrity in public disclosure.

Image above: North slope Cleveland Fire Highway 50, east of St. Pauli's Restaurant.

14. Home and Community Protection in Frequent Fire Forests--Not an Excuse to Override Ecological Integrity.

The King Fire DEIS should call on homeowners to take seriously the State mandated fire clearance requirements in (PRC 4291-4299) for home protection which is the responsibility of homeowners living in fire-prone forests (Cohen 2008). The home ignition zone, which is the relationship between a structure and its surroundings, is where fire protection should start. All community fire safety programs (Fire Safe; Fire Wise Communities, USA; Community Wildfire Protection Plans) start with an understanding that home protection starts with the home and works out from there. While it is important that the Forest Service prioritize fire hazard reduction nearest to communities, the homeowner and community in forested landscapes have their own responsibilities.

"Wildfires are inevitable but the destruction of homes, ecosystems and lives is not" states Forest Service-Rocky Mountain Research Station fire scientists (Calkin et al. 2014). The fire behavior specialists have spent decades examining home ignition criteria, fire and weather interactions and the socio-cultural ramifications of increased WUI development and public perceptions regarding wildfire. The authors point out, there is not a wildfire control problem in the WUI, there is a home ignition problem determined by home conditions. In what the researchers call the "wildfire paradox" is the fact that by "using fire suppression to eliminate large and damaging wildfires ensures the inevitable occurrence of these fires." As an alternative, the authors emphasize strategic risk assessment to reduce home ignition potential. This activity is where the Forest Service should focus in working with communities and fire safe councils adjacent to the Eldorado National Forest.

Fire Wise Communities, USA is a national program that includes significant public-private collaboration in support of community fire protection. In approximately 2010, Sierra Forest Legacy became trained Fire Wise Community certifiers for the central Sierra Nevada. Certification included training in home protection techniques at the community association level and it empowered community members to take responsibility for the choices they have made to live in frequent fire forested environments. Part of that experience was to encourage homeowners to create defensible space and a Fire Wise home environment that could survive fire without fire engines or fire-fighter support.

http://www.sierraforestlegacy.org/CF_CommunityProtection/FirewiseCommunities.php

The home ignition zone principally determines a home's ignition potential. The zone includes the home in relation to its surroundings within 100–200 feet of the home.

Figure above from Jack Cohen (2008) Forest Service, Rocky Mountain Research Station

We bring this issue up because we are concerned that due to political pressure the Forest Service is over-reacting in the south fire area FMZ by taking unnecessary measures to fire proof this area. This action is an unwarranted over-reach that sets an ecologically damaging precedent in terms of treatment widths and intensity of FMZs while exempting the local residents from the burden of personal responsibility when living in a fire prone, forested environment. Fire-wise homeowner measures, and reestablishing frequent fire use is the long term solution to reduced fuel loads and community protection. Fire suppression and fire exclusion is the reason some of the unfortunate homeowners lost their dwellings. All of the fire protection impacts should not fall on public lands and their ecological integrity.

There are several misconceptions regarding the public's perception of fuels treatments, their effectiveness and the longevity of their effectiveness. In Reinhardt et al. (2008) the authors state plainly that the "wildlands cannot be fireproofed" but instead should be made resilient to fire. They recommend efforts should focus on reducing fire severity and intensity but not fire occurrence. This is consistent with our recommendations and the fire staff recommendations for the King Fire restoration project. The condition is called FIRE-LANDSCAPE REALIGNMENT.

The long-term fuels strategy should be inclusive of fire and not suggest that treatment areas are solely designed to allow effective fire suppression. Under certain conditions, like those experienced on day four of the King fire, suppression may not be effective or possible. While fire suppression and State mandated homeowner fire clearance (PRC 4291-4299) plays a key role in protecting homes and communities, outside of the WUI, fire suppression and fire exclusion are significant barriers to implementing a large-scale fire and fuels management program to correct past management actions such as fire exclusion (USDA 2011, p. 2).

The forest should recognize the King Fire as an opportunity, both ecologically and economically, to reintroduce fire at a scale appropriate to the Sierra Nevada forests. North et al. (2012) highlights the pressing need to use fire to treat fuels at the landscape scale, stating:

> "With less than 20% of the Sierra Nevada's forested landscape receiving needed fuels treatments, and the need to frequently re-treat many areas, the current pattern and scale of fuels reduction is unlikely to ever significantly advance restoration efforts. One means of changing current practices is to concentrate large-scale fuels reduction efforts and then move treated areas out of fire suppression into fire maintenance. A fundamental change in the scale and objectives of fuels treatments is needed to emphasize treating entire firesheds and restoring ecosystem processes. As fuel loads increase, rural home construction expands, and budgets decline, delays in implementation will only make it more difficult to expand the use of managed fire. Without proactively addressing some of these conditions, the status quo will relegate many ecologically important areas (including sensitive species habitat) to continued degradation from either no fire or wildfire burning at high severity."

The majority of the King Fire area has seen little fire in the past century (DEIS 3-53). The yellow pine and dry mixed conifer forests within the King Fire supported frequent fire and display a pre-European fire return interval (FRI) of about 11 years. In other works, these forests evolved with a fire approximately every 9.1 years over the past century (Van de Water and Safford 2011). It is clear there is a need to increase the use of managed fire for multiple resource benefits. The most effective way to increase resiliency and the number of acres treated is to transition away from a suppression-dominated and reactionary fire policy and begin implementing a landscape-wide fuels management program that uses fire to mimic natural fire regimes and allow the use of natural ignitions or "free-burning fires" to "regulate fire-induced effects across the landscape"

(North et al. 2009). In other words, the best way to limit fire size and uncharacteristic fire effects is when fire burns into recent fire and eventually becomes self-regulating (Falk 2006; Stephenson 1999; Collins et al. 2009).

The Region 5-Sierra Forest Legacy Managed Fire MOU is a positive step in overcoming constraints to implementing a landscape-wide prescribed fire program. On national forests the first step to overcoming these constraints is to plan as though they will be overcome by including landscape plans, staffing and operational capacity necessary to do active burning. A large-scale prescribed fire program is the only option available to perpetually reduce fuels and reduce the economic impacts of mega fires as well as maintain ecological integrity across the landscape and ensure subsequent fires are more likely to burn less severely and within NRV. Consider the result of study on fire reburn severity in Yosemite National Park by van Wagtendonk et al. (2012):

> "Second and third fires reburned larger areas at high severity when the time between fires was nine years or greater, and nearly half of the original high severity areas reburned at high severity. The third and fourth fires did not burn at high severity when the return interval was less than nine years. These changes indicate that the effect of fuel reduction is offset by fuel accumulation over a nine-year period. Fuel accumulations and deposition rates determined by van Wagtendonk and Sydoriak (1987) and van Wagtendonk and Moore (2010) substantiate that nine years is sufficient time for fuels to recover to their pre-burn levels."

Based on the concept that historic fires limited fire size of current burns, there is an immediate need to return fire to the system within 5-10 years and any delays will have ecological consequences that affect the resiliency of the succeeding forest. The notion that the Forest Service "may contemplate future projects to address ecosystem restoration and resilience such as prescribed fire or additional fuels treatments" is not acceptable. Instead, developing an active (and early) fire restoration program for the King Fire landscape should be the very foundation of this proposed action.

We have yet to see the agency begin to scale up the prescribed fire program and planning for such future projects will be time consuming, further delaying returning fire to the system. There is no reason that the EIS should not include the establishment and implementation of a landscape-wide long-term fuels management strategy that begins the process of returning fire to the landscape on a regular basis with the goal of fire-landscape realignment. It leads us to believe the ENF fire cadre and the Regional Ecology shop have not been consulted or their input was ignored, in your internal project development process. We ask that the purpose and need be revised to include the need to restore low and mixed severity disturbance regimes to this landscape and that project activities include: (1) defining and prioritizing burn units based on proximity to communities and large-scale units that maximize the number of acres burned at the lowest cost; (2) defining fuel conditions that indicate burning is necessary and appropriate within burn units and within reforested areas; (3) natural and manmade fire breaks that will be used as unit boundaries; (4) the biotic and abiotic conditions under which each unit can and should be burned, including snag patches; and (5) the personnel required to implement the strategy based on the average annual number of burn days and fire frequency interval. The timeframe for restoration and recovery activities should be 50 years (5 FRIs) or more. Finally, we understand that managing unplanned ignitions for resource benefits are not allowed under the current forest plan; therefore, we ask that a non-significant forest plan amendment be proposed in this EIS that creates a King Fire-Fire Management Plan that allows for unplanned ignitions to be managed for multiple natural resource benefit.

15. Potential Effects of Herbicide on *Acrtostaphylos nissenana*

Two basic life history patterns are found among species within the genus *Arctostaphylos* with respect to wildfire; *Arctostaphylos* plants either survive wildfire and resprout from a basal burl (sprouter) or *Arctostaphylos* plants are killed by fire and regenerate from seeds stored in the soil (obligate seeder). Almost all at-risk species in the genus *Arctostaphylos* have the obligate-seeding strategy. Based on the species account in the DEIS, it is likely *A. nissenana* is an obligate seeder. Obligate seeding *Arctostaphylos* species require 5 to 25 years before substantial seed crops are produced (Keeley 1986). Seeds typically suffer high rates of predation (Kelly and Parker 1990); however, seed caching by seed predators may be an important mechanism by which seeds are buried to a sufficient depth at which they may survive high-intensity wildfires. Parker (2010) found that while overall seedling density declined with fire intensity, the proportion of seedlings emerging from rodent caches increased. Seeds that are not eaten are slowly added to the soil seed bank, eventually reaching depths at which they can survive fire (Parker 2007). Obligate seeding *Arctostaphylos* species tend to have fire-dependent seedling recruitment; and mature stands tend to be even-aged, exhibiting little to no regeneration during fire-free intervals (Safford and Harrison 2004). Because most *Arctostaphylos* are shade-intolerant, in the absence of fire, stands may be "shaded-out" by trees and succeed to forest. However, seed viability may last many decades and it is not uncommon for wildfires to germinate long-dormant seedbanks in areas *Arctostaphylos* were not known to occur prior to the fire. Since there have been very few fires within the project area over the past 100 years, it is entirely possible populations of *A. nissenana* succeeded to forest and long dormant viable seedbanks were "awakened" by the King Fire in locations the species was not previously known to occur. Considering that all of the action alternatives proposed in the DEIS include many thousands of acres of salvage logging and vegetation control associated with reforestation, including thousands of acres of herbicide treatment of shrubs in the genus *Arctostaphylos*, we ask that you develop measures to survey for, identify, and avoid *A. nissenana* during project activities that may result in injury or death of the species in areas the species was not known to occur prior to the fire. The forest plan requires surveys to be undertaken prior to activities in sensitive plant habitat.

16. Effects of Herbicides

Loss of Species from Disturbance is not Sustainable in Today's Changing Climate

The level of disturbance now occurring in the perimeter of the King Fire on private timber lands will result in widespread elimination of native species and ecological processes. Similar actions by the Forest Service, while not as extreme, will add cumulatively to the destructive load that the region has had to bear. Recovery of wildlife species in the area is dependent upon food and habitat, which nature provides in abundance in herb, shrub, and hardwood regeneration. It is likely that the proposed activities will instead compromise the viability of many native plant species within the fire perimeter.

In the Sierra Nevada, resilience to climate change is best arrived at by allowing fire to regulate structure and succession (Hurteau and North 2010). Science affirms the importance of allowing natural succession to take place to maximize climate change adaptation and resiliency. A 2010 literature review by Thompson et al. (2010), co-authored by the Forest Service, concluded:

> “The ecological stability, resistance, resilience, and adaptive capacities of forests depend strongly on their biodiversity. The diversity of genes, species, and ecosystems confers on forests the ability to withstand external pressures, and the capacity to ‘bounce back’ to their pre-disturbance state or adapt to changing conditions.”

Ecologically healthy and resilient landscapes, rich in biodiversity, will have greater capacity to adapt and thrive in the face of natural disturbances and large scale threats to sustainability, especially under changing and uncertain future environmental conditions such as those driven by climate change and increasing human use.

Increased Fire Hazard due to the Large Number of Plantations with Highly Fire Prone Structure and Composition, on Public and Private Lands.

In these comments, we are reiterating some of the information we have provided earlier in the document, from the perspective of the effects on native plant communities and the wildlife that depend upon them. Reburning from future mega-fires in plantations will contribute to a trend towards type conversion of the forest to human-dependent tree cropping systems and non-native weed species. Climate change feeds into this loop, inevitably resulting in ever more fires and loss of species.

The proposed activities in the King Fire project truncate or skip ecological processes altogether, target non-conifer native forest species for elimination, and simplify forest structure and composition in order to grow a tree crop. As the Forest Service’s most famous ecologist Aldo Leopold said:

> “The last word in ignorance is the man who says of an animal or plant, "What good is it?" If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering.” –Aldo Leopold

Hundreds of acres of plantations planted by the Forest Service and industrial timber companies burned at high severity in the King Fire. The acreage and locations of previous plantations must be included in the EIS to allow for a comparison between past practices, the current proposal, and to allow examination of the cumulative effects of past practices.

Reforestation as proposed by the ENF is an agricultural endeavor, not grounded in ecology. The goal is to quickly grow tree fiber for commercial use. In so doing, reforestation activities contribute significantly to the fire and fuels problem in California’s Sierra Nevada, and contribute to the further decline of wildlife, water quality, and other environmental amenities. There is no ecological justification for the proposed reforestation activities.

In testimony on September 22, 2004 before the Senate Committee on Energy and Natural Resources, the venerable Dr. Jerry F. Franklin, Professor of Ecosystem Science at University of Washington, cautioned:

> "Where management goals include maintenance of native biodiversity and ecological processes associated with natural ecosystem recovery, then a universal mandate for timber salvage and artificial reforestation is inappropriate…In some cases, **reforestation of fire-prone sites with full stocked plantations is actively recreating the fuels that will feed the next unnatural stand replacement fire**"(emphasis added).

It is not necessary to bulldoze, spray, and plant to get a forest back. Nature has grown immense forests long before silviculturists came along. Forest Service research scientists have affirmed this (McDonald and Fiddler 1993), although the intention of this 1993 paper was not to affirm our position against herbicide use. Nevertheless, the researchers did conclude that trees grow without herbicides—a fact that should be obvious.

There are few that know more about growing old-growth forests than Dr. Franklin, who also said, "Fifty years for natural reestablishment of forest cover is not a particularly long period." The DEIS failed to offer any discussion as to why you are in such a hurry. Even in areas where the seed bank has been depleted, it is not necessary to interrupt the natural process with large scale intervention. Is it the revenue that salvage logging and planting (KV funds) will bring in? If so, this should be stated up front in the DEIS. Indeed, in 2009, a federal 9th circuit judge criticized the Forest Service for biased decisions about logging projects due to financial incentives:

> "The financial incentive of the Forest Service in implementing the forest plan is as operative, as tangible, and as troublesome as it would be if instead of an impartial agency decision the agency was the paid accomplice of the loggers….Against this background of precedent, the Forest Service's own regulation requires that the Forest Service 'objectively evaluate all reasonable alternatives.' 40 C.F.R. § 1502.14(a) (2000). Can an agency which has announced its strong financial interest in the outcome proceed objectively? Could an umpire call balls and strikes objectively if he were paid for the strikes he called?" (*Sierra Forest Legacy et al v. Rey et al*, 577 F.3d 1015 9th Circuit 2009).

The DEIS is Lacking Important Information.

The cumulative effects are not adequately characterized, as there is no analysis of the environmental effects of the massive logging now occurring on private timber lands when combined with the proposed action. There is also no mention of past logging activities that contributed to the severity of the King Fire. There is no discussion of the role that the previous silviculture model played in the severity of impacts in the King Fire. This is one of the most serious cumulative effects that needs to be discussed, because in this proposal, the FS is planning to do it again.

The DEIS failed to disclose the lost value of trees that burned in the existing plantations. This is relevant information and should be included for the public and decision makers to consider before making a decision to do the same thing again. Similarly, the cost of extinguishing the fire should be disclosed as part of the analysis. This is also connected to the hazardous fuel configuration of the area due to the previous episodes of green tree and/or salvage logging and plantings. These are connected actions and have resulted in significant cumulative impacts. Further, logging of burned forest now may "commit resources prejudicing selection of alternatives before making a final decision" (49 CFR § 1502.2 (f)) in any future decisions about planting, since salvage logging is known to interfere with natural regeneration (Donato et al 2006, Lindenmayer et al 2008, Peterson et al 2009). If clearcutting is used this would predispose the agency towards future tree planting.

Herbicide Use has not been shown to be Essential

The DEIS made no mention of the guiding document for reforestation and vegetation management in the region, the 1989 FEIS and ROD for Vegetation Management for Reforestation. Since no other comprehensive vegetation or herbicide management EIS has been approved through the NEPA process, this document is still the guiding direction for the agency. The 1989 ROD selected Alternative 1 which explicitly states: **"Herbicides are to be used only where essential to achieve the resource management objectives"** (VMR ROD, p.9).

Reviewing different methods of vegetation release, Forest Service PSW researchers McDonald and Fiddler (1993) concluded that, "If the goal is to create a forest with several age-classes and variable structure, but with slower seedling growth, longer time to harvest, and less species [conifer] diversity in early seral stages, then it is possible to accomplish this without herbicides and other means of vegetation control." SNEP, still considered "best available science" (see USDA SNFPA 2004, Vol. 1, p. 67) concluded, "All methods will release conifer seedlings from severe competition and enable the development of a new stand," and emphasizes that the objective of the land manager should guide the choice of vegetation management (SNEP, Volume III, p. 508). We conclude that it is therefore not essential to use chemical herbicides to achieve the stated purpose and need. We can see nothing in the purpose and need for the project that suggests that conifer growth, accelerated through the use of herbicides, is essential. The risks to wildlife, including pollinators that are increasingly threatened throughout the continent, and the loss of native species outweigh the projected benefit of accelerated growth of conifer trees. In light of climate change, the projected future growth and harvest are speculative, and may have little chance of success in any event. The planted trees certainly will not meet the definition of ecological integrity as described by the 2012 Forest Planning Rule:

> "The quality or condition of an ecosystem when its dominant ecological characteristics (for example, composition, structure, function, connectivity and species composition and diversity) occur within the natural range of **variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence"** (36 CFR § 219.19, emphasis added).

Analysis of the Effects of Herbicides is Inadequate

We are concerned that most of the references that we provided to you during scoping were not addressed in the DEIS. As such we find ourselves repeating some of the same information below. NEPA requires "accurate scientific analysis" (40 CFR §1500.1(b) and "environmental impact statements shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made" (40 CFR §1502.2 (g)) and shall include a "summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment" (40 CFR §1502.22)).

The DEIS acknowledges that it lacks information about the role of glyphosate formulations in causing endocrine disruption effects, although we provided you with several science papers relative to this issue. The DEIS states: "EPA is currently requiring additional tests on glyphosate to assess the potential of glyphosate to cause endocrine effects. Depending on the results of these tests, exposure to other agents which affect endocrine function could be associated with cumulative effects (SERA 2011)" (p. 3-116, DEIS). Please clarify what this sentence means. What other agents? We assume that the "other agents" refers to the additives or adjuvants, specifically the surfactants that are always added to glyphosate formulations, but the EIS needs to clarify this. Moreover, there are abundant references in the scientific literature attesting to endocrine disruption, and the reproductive toxicity of glyphosate formulations affecting wildlife species as well as human cells. Analysis must be included to assess the safety of the chemical products that will be used in the project area in regards to endocrine disruption, as well as other typical toxicological endpoints (reproductive toxicity, immunotoxicity and neurotoxicity). Failure to adequately disclose the potential environmental impacts from the project is not in compliance with NEPA. In 2001, a federal judge ruled against the Tahoe National Forest in approving the Cottonwood Project due to the failure of the agency to assess the full range of environmental impacts from the use of chemical herbicides (Cottonwood Fire Vegetation Management Environmental Assessment) (*Californians for Alternatives to Toxics et al. v. Dombeck*, No. Civ. S-00-2016).

Endocrine disruption is of particular concern, not only for humans involved in the applications, but to wildlife that will be exposed to the chemicals. Endocrine disruption can occur from minimal exposures, of the type that is most likely to occur in forestry applications, as when glyphosate formulations run off into standing water and streams, or pollinators or other organisms are sprayed during application. These are called "environmentally relevant" exposures, as they are likely to occur in the environment at low doses, and endocrine disrupting chemicals have significant effects at even infinitesimally small concentrations of exposure (in the realm of .001 ppb), in the same way that hormones have significant effects on living organisms at tiny amounts in the body. That is why they are called "hormone mimics," "endocrine mimics," or "endocrine disruptors." Formulations of glyphosate with surfactant adjuvants have been identified by scientists as causing endocrine disruption, and the Forest Service need not wait for the EPA to conduct its own analysis.

The key issue with glyphosate is that the environmental effects must be relevant to the products as they are actually applied in the field, as mixtures. There are numerous toxicological issues relative to glyphosate, as research scientists have now focused on studying how glyphosate products behave in real life usage, in other words, as mixtures with surfactants and other adjuvants. The analysis must relate to the impacts of the herbicide products as they will actually be used.

The surfactants that are proposed to be used with glyphosate, “Hasten or equivalent or SylTAC or equivalent,” may behave similarly to the surfactant found in Roundup, POEA. “The direct glyphosate action is most probably amplified by vesicles **formed by adjuvants or detergent-like substances that allow cell penetration, stability, and probably change its bioavailability and thus metabolism**” (Gasnier et al 2009, emphasis added). The role of surfactants is to allow glyphosate to permeate through animal cell membranes and has been demonstrated in numerous scientific studies (see Benachour and Seralini 2009, also see summary in Gasnier et al 2009). Benachour and Seralini (2009) also used highly diluted, environmentally relevant dilutions to test the effects of glyphosate products on human cell lines, finding cell death and DNA fragmentation from all formulations tested, but the damage was worse in the formulations with surfactants added.

In 2004 and 2005, research published from University of Pennsylvania documents the severe effects from glyphosate products containing the surfactant POEA (in Monsanto’s Roundup) upon frog tadpoles at exposure concentrations considered “environmentally relevant,” dilute concentrations easily encountered by the organism in the field where runoff may occur (Relyea 2005a, b, c). Further, Relyea found that different species react differently to the same chemical exposures. For example, Roundup exposure at realistic concentrations killed all leopard and gray tree frog tadpoles and 98 percent of wood frog tadpoles. The DEIS failed to consider that some amphibians (for example, Western toad) undergo metamorphosis in ephemeral pools that may occur inside clearcut units, so the issue is not limited only to aquatic applications. It is apparently not possible for the Forest Service to get a list of the ingredients in these products, making it convenient to ignore possible toxic environmental effects. Lack of information about the composition of the materials proposed for use should be a good enough reason to reject the use of such products on public lands.

Glyphosate products were implicated as endocrine disrupting chemicals (Richard et al. 2005) and found to interfere with transcription during cell mitosis (Marc et al. 2002, 2005). A summary of problems associated with false claims about the safety of Roundup—and not just glyphosate—were compiled by the New York State Consumer Fraud division of the Attorney General’s office. Monsanto was fined $50,000 and found guilty of false advertising in New York in 1996. Monsanto was also fined in France, in 2007, for false advertising of the product Roundup. In March 2015, glyphosate was declared a “probable carcinogen” by the World Health Organization (IARC 2015, Guyton et al 2015).

Amphibians are particularly vulnerable to exposure to toxins because of their ability to absorb chemicals through their thin skin. Effects to amphibians must be analyzed in terms of acute and chronic toxicity as well as endocrine disruption, immunotoxicity, neurotoxicity, and reproductive toxicity. Sources of exposure must be analyzed relative to drift and run-off, puddles/ephemeral pools etc. and the surfactants used with glyphosate products must be disclosed and discussed in the analysis of environmental impacts. Claims of the safety of Roundup’s active ingredient, glyphosate, in aquatic environments is not supported by recent scientific studies. In one study, Perez et al (2007) concluded: “In contrast to the manufacturers’ claims on the environmental safety of glyphosate, several studies have demonstrated that glyphosate alone or in combination with the additives used in commercial formulations may be damaging to aquatic biota."

Surfactants may be the principal toxic component in the formulated glyphosate products to aquatic organisms (Tsui and Chu, 2003). In a review of toxicological data, Giesy et al. (2000) found POEA to be more toxic to fish than glyphosate alone. However, glyphosate is never applied alone. Recently, studies of human cell line responses to agriculturally relevant, diluted glyphosate based herbicides were found to "present DNA damages and CMR effects on human cells and in vivo."

The analysis must not be limited to toxicological effects analysis only. Conclusory remarks about effects to wildlife, rare plants, and people based on supposition without evidence are not acceptable ("Agencies…shall make explicit reference by footnote to the scientific and other sources **relied upon for conclusions in the statement**" NEPA 40 CFR § 1502.24). References and resources should be supported by citation and footnote.

To summarize the essential analytic information that is lacking in the materials used to determine the effects of the project:

- Analysis of the environmental impacts of the chemicals as they are actually applied in the field, as a formulation or mixture
- Disclosure of the environmental impacts of the degradates and secondary metabolites of the chemicals
- Disclosure of endocrine disruption effects at environmentally relevant (dilute) exposures
- Cumulative effects analysis of the ecological effects to ecosystems from use of herbicides to manipulate vegetation, at the landscape level taking into consideration the impacts on private lands.

In sum, we believe that the controversy surrounding herbicide use, and the lack of updated pesticide literacy on the part of the Forest Service, demonstrates the need for a new Vegetation Management EIS region-wide to bring the agency up to speed with the most current and relevant science. We also believe that the lack of updated information about the toxicity of glyphosate, the risks to wildlife as well as applicators and others that may be exposed to the chemical, in combination with cumulative impacts from the uses on adjacent private timber lands, indicate that the agency must set aside the proposal to use herbicides.

17. Western Bumble Bee and Other Pollinators

We are concerned that the proposal does not adequately mitigate for impacts to pollinators, including the ENF sensitive species Western bumble bee. While acknowledging that "Herbicide use for enhancing reforestation can greatly reduce nectar supplies, which in turn limit bumble bee colony success," the DEIS suggests that impacts are short term. However, the use of herbicides in Alternatives 2, 4, and 5 would effectively eliminate the shrub and non-conifer vegetation over the life of the unit (see plantation image below). Fire has been shown to play a critical role in producing an abundance of nectar volume and a diversity of nectar producing plants immediately after fire—peaking in year two—that may be necessary for the cyclic population bursts that are critical for the survival of pollinators and the reestablishment of the plants that are their partners (Potts et al 2003, Grundel et al 2010). Potts et al (2003) found both floral abundance and nectar concentration were highest the second year after fire, and began to decrease after that. Total nectar concentration available to bees decreased by 15% from its highest point 2 years after fire; but as nectar concentration declined over time, nectar volume increased as perennial species with longer floral tubes begin to appear in succession. This is an example of the complexity of natural succession that is barely understood, and naturally regenerating forest site after fire is has now become the "rarest type of forest," (see our scoping comments documenting this, p. 8-11) with obvious negative effects on pollinator dynamics.

Kearns and Inouye (1997) reported that fragmentation resulted in reduced seed reproduction and reduced adaptation fitness in plant populations, since fragmentation reduced pollination needed for outcrossing. Rare plants can become isolated in "ecological traps" (Stebbins 1979) surrounded by other types of vegetation. Pollinators frequently will not cross large distances between small populations, and some exhibit density dependent foraging behavior: "small patches suffered reproductive failure due to lack of effective pollination when critical thresholds of isolation were exceeded. In contrast, sufficiently large patches attracted pollinators regardless of their degree of isolation" (the Allee effect; Groom 1998).

On May 19, 2015, the White House released the *National Strategy to Promote the Health of Honey Bees and Other Pollinators* (Pollinator Health Task Force 2015). One of the commitments in the national pollinator strategy is to "Restore or enhance 7 million acres of land for pollinators over the next 5 years through Federal actions and public/private partnerships." USDA is, and will continue to be, a key player in the development of the strategy. What better action could be taken than to permit the natural succession of flowering shrubs, hardwoods, and perennial species in the plantation units proposed for the King Fire? Pollinators from many different insect families are found utilizing all the different species of *Ceanothus* shrubs.

Image below: Bumblebee on *Ceanothus parvifolius*, King Fire June 2015 in unburned area. Is it the rare Western bumblebee?

Ceanothus are nitrogen-fixing shrubs that play a critical role in forested ecosystems to build sufficient nitrogen in the soil to ultimately support climax conifer species. The ecological role of these shrubs is unequivocal: they build soil, they provide nectar and pollen for pollinators and other species, provide food and shelter for deer, and food and nesting materials for birds. It is remarkably short-sighted to think that forest ecosystems can simply do without these species across thousands of acres of clearcuts and plantations. Indeed, some research has shown that over the long term, conifers grow equally well on sites where the shrubs and hardwoods have been left in place. This is mostly dependent upon the soil site conditions. Sites with very rocky soils depleted of organic material will have a very difficult time supporting conifers until the soils have been improved through the action of natural succession. This is where the nitrogen-fixing shrubs like *Ceanothus* are necessary after fire. The environmental impact analysis must include taking a hard look at these issues and analyze the contribution that *Ceanothus*, manzanita, *Cercocarpus* and other shrubs make to soil health, pollinator and avian viability, and reduced fire hazard (Horowitz 1982, Conard et al 1985). Research conducted at the Teakettle Experimental Forest in the Central Sierra concluded that "*Ceanothus* contributes to a greater proportion of total N mineralized than based on cover alone, and may be important for forest nutrition under current conditions and after forest burning" (Erickson et al 2004). Other researchers have stressed the importance of maintaining pioneer species because of the mutually beneficial linkages with soil microbiota and mycorrhizal fungi that are important for reestablishment of the forest in later successional stages (Horowitz 1982, Molina and Amaranthus 1991).

Other nitrogen-fixing shrubs and perennials that are abundant after fire include *Alnus*, *Cercocarpus*, *Lupinus*, *Lathyrus*, *Astragalus*, *Trifolium*, *Alnus*, *Vicia*, and *Lotus*, and many others. Rather than killing these beneficial plants, Jurgensen et al (1991) suggest leaving a mosaic of beneficial species like *Ceanothus* while others suggest actually planting these species where needed to replenish soils (Everitt et al 1991).

Another successful strategy to minimize competition with planted conifers in the PNW region 6 is to plant trees that are at least two years old. Region 6 has the same requirement as California, e.g., herbicides may only be used as a last resort where found essential to obtain management objectives. Unless there is a requirement in the purpose and need to grow conifers to marketable size in 30 years (and this could only happen on high soil sites under the best of circumstances, which we presently do not have because of climate change), then herbicide use cannot be found to be essential. In a study of the effects of fuel reduction in plantations that burned in the 2008 American Complex Fire on the Tahoe NF, FS ecologist Hugh Safford reported that plantations with medium to high cover of live shrubs mostly survived fire (Safford 2008). This effect has been reported by firefighters for years, but is rarely documented. Weatherspoon and Spooner also reported in 1995 that grasses were the major contributor to high losses in plantations, along with the conifers themselves, versus shrubs which had the least contribution. It should also be noted that during the King Fire, 12 firefighters saved their lives when guided by a helicopter pilot above them to a stand of manzanita, where they were able to deploy their fire shelters and the fire dropped away. Manzanita is surprisingly fire resistant when it is alive and green, whereas dead shrubs, killed by herbicide, are simply more fuel.

Image above: Plantation in King Fire, Georgetown Ranger District

The picture is typical of the plantations that burned in the King Fire. It is clear that there were no shrubs or hardwoods in the unit prior to the fire, as they were eliminated with herbicide spraying at an earlier time in exactly the same fashion as is now planned.

The understory in these stands provides little to nothing for wildlife. It is therefore not accurate to say that such practices are not significant or have only a short term effect on species composition and the wildlife which depend upon them for food, nesting, and other habitat elements. Release, whether by spray or by hand, eliminates the other forest plant species that comprise a healthy, vibrant, and productive forest.

In the image below, taken on private lands outside the King Fire on Wentworth Springs Road near Georgetown, and within the Eldorado National Forest, the understory has been completely eliminated with herbicide and thinning has occurred but the trees are left on the ground creating a fire hazard. There is almost nothing here for wildlife. This has been a typical scene throughout the forest for decades.

Image above: Plantation adjacent to Eldorado National Forest on private industrial forest lands

This is obviously significant for iconic species like black-tailed deer. In the 1998 state-wide assessment of the perpetually declining status of deer herds in the state, it was found that "**Declining abundance of early successional vegetation communities** in forestland was considered to have the greatest effect on long-term deer populations. The primary mechanism to establish those communities is fire, either wildfire or prescribed" (CDFG 1998, p. 35, emphasis added). The DEIS failed to evaluate the impacts of the loss of early successional species upon the deer herds. Only the use of fire assures the maintenance of species through the natural ecological processes to which all the living things in the forest are evolutionarily adapted. The agency must include an alternative that utilizes only fire to maintain forest structure, composition, and ecological processes to maintain resiliency and species viability. All of the action alternatives should also demonstrate a methodology to maintain native diversity for the benefit of wildlife throughout the project area, including in planted areas. The planting schemes proposed thus far do not provide sufficient space for the maintenance of non-conifer species.

Further, there needs to be a methodology to ensure that less common species are preferentially maintained and not mistaken for widespread and common species. For example, *Garrya fremontii* or Fremont's silk-tassel, occurs in the King Fire, but has become uncommon on the ENF due to previous management activities both on private and public lands. It can be expected to be replenished locally by the fire from an existing seedbank. As it is not common on the forest, but looks almost exactly like manzanita to the untrained eye (prior to blooming), indiscriminate spraying will likely result in loss of this important browse species (Sampson and

Jespersen 1963). The EIS must identify a methodology to ensure that management activities do not contribute to loss of biodiversity through an unfortunate lack of knowledge of the native forest species composition.

18. Sensitive Plant Species

We appreciate the commitments to flag and avoid as well as monitor management activities in the vicinity of sensitive plant populations in the King Fire project area. However, we remind the agency that the 2004 Sierra Nevada Forest Plan Amendment Supplement directs the agency to design projects to "conserve or enhance" sensitive plant species <u>and</u> their habitat, which means that simply flagging and avoiding existing populations is not a sufficient mitigation. In these populations, if the fire has improved habitat for the species, plantation units should not be installed at these sites. These sites should be managed in perpetuity for the benefit of the rare plants, which may mean reintroducing fire at regular intervals. Furthermore, the Forest Service must incorporate survey information "early" in the planning process in order to "[m]inimize or eliminate direct and indirect impacts from management activities" on sensitive plants unless the activity is designed to maintain or improve plant populations (SNFPA Standards & Guidelines, Vol. 1, p. 366). Surveys must be conducted according to the procedures outlined in the Forest Service Handbook (FSH 2609.25.11). Since the massive fire has now done the job of improving habitat for these plants, and possibly others that are yet unknown, it is incumbent upon the Forest Service to not endanger this process during salvage logging and planting activities. Without prior surveys, there is no way that the agency can guarantee the effectiveness of the proposed sensitive plant mitigations. No ground disturbing activities may be permitted until surveys have taken place.

Moreover, it is essential that populations that burned in the fire are protected, even if the plants appear to have been burned. The species are still there, in the form of seeds, in the soil. No salvage and reforestation activities are permitted in this habitat. This needs to be clarified in the FEIS as it is not clear in the draft document. These requirements apply to ALL sensitive plant species. "Resource plans and permits, contracts, and other instruments for the use and occupancy of National Forest System lands shall be consistent with the land management plans." 16 USC. § 1604 (i). *See* <u>Neighbors of Cuddy Mountain et al. v. USFS</u> (9th Circuit 1998) 137 F.3d 1372. Also *See* <u>Sierra Club et al. v. Eubanks, et al</u>. No. Civ. S 03-1238 (Duncan Canyon Roadless Area, on the Tahoe NF).

19. Direct, Indirect and Cumulative Impacts associated with Cattle Grazing to Sensitive Plants, Recovering Riparian and Meadow Vegetation, Soils, Water Quality and Sensitive Wildlife Species Were Not Analyzed in the DEIS, Contrary to NEPA 40 CFR § 1502.15; §1502.16.

There has been active cattle grazing allotments in the King Fire perimeter for many decades. However, the DEIS made no mention of retiring allotments or extended "resting" of the existing grazing permits until recovery of resource conditions that support desired conditions and ecosystem integrity occur. This should be the case.

We are concerned that at DEIS 2-27, Table 2.15 Summary of Design Criteria related to the federally listed California red-legged frog is a section RR-1 and RR-2 requiring range staff to contact permittees annually regarding range improvements and maintenance. This leads us to assume that there will be active grazing, immediately, in the post-fire environment. This permitted activity is potentially harmful to sensitive habitats and species, soils and water quality in the post-fire environment. In part, grazing impacts are magnified since cattle occupying the hot, dry landscape post-fire will be even more likely to concentrate in cooler, moist areas. These areas are the most sensitive part of the burned landscape. Further, cattle grazing will exacerbate the proliferation of non-native invasive weed species. Many species of native plants will be replenished through the action of fire, and it is important for their long-term survival that seed production is maximized during the first few years to decades, until canopy closure of the emerging conifer sere or vegetation layer begins to shade them out. Livestock grazing, like plantation forestry, eliminates or truncates these natural successional processes that are essential to the viability of populations of early successional forest plants and wildlife.

We see no reference in the King Fire DEIS to impacts from cattle grazing on sensitive plants, recovering riparian and meadow vegetation and habitat, aspen stands, seeps and springs, sensitive wildlife species, and proliferation of invasive weed species. This lack of disclosure is contrary to NEPA's requirements to disclose potential impacts to national forest resources. One solution would be to require full rest of all allotments in the burn perimeter for 5 years or at such time when resources specialist agree that monitored grazing can proceed with appropriate mitigation measures in place to aid natural resource recovery. Concentrated cattle use adjacent to aquatic resources also poses a public health risk that should not be ignored. See: http://www.hindawi.com/journals/jeph/2012/760108/

20. Research Natural Area Peavine Point

Page 3-281, analysis of effects to the Peavine RNA (the proper name of the RNA is Peavine Point), suggests that not only logging but planting and unnamed other activities are proposed to occur in the RNA. It proposes logging 23 to 30 acres of trees, depending upon the alternative, and "Direct effects would be removing trees, planting, and mechanical treatments…In all alternatives, mechanical treatment would remove conifers in CWHR Size Class 4 and 5 in the RNA, particularly as they are found along roadsides."

These activities are not permitted under the direction of the FS Manual, see Ch. 4063.34 Research Natural Areas which states:

> "Use only tried and reliable vegetation management techniques and then apply them only where the vegetative type would be lost or degraded without management. The criterion is that management practices must provide a closer approximation of the naturally occurring vegetation and the natural processes governing the vegetation than would be possible without management."
>
> "The Station Director, with the concurrence of the Forest Supervisor, may authorize management practices that are necessary for invasive weed control or to preserve the vegetation for which the Research Natural Area was created (FSM 4063.3). These practices may include grazing, control of excessive animal populations, or prescribed burning. **Take extra care to protect undisturbed ecological climax conditions, such as old-growth forests**" (emphasis added)."

Summary

Managers of post-fire landscapes must make an ecological choice: (1) provide structural complexity, ecological integrity, fire-landscape realignment, and support species viability throughout the post-fire recovery process; or (2) compromise complexity and ecological integrity, and experience high severity fire affects as the new normal while preventing species viability to reach mature forest conditions sooner. In addition to the ecological costs associated with reaching mature forest conditions sooner, this lack of patience comes with significant monetary costs to the public as well. We ask that you take great strides to minimize the effects of the proposed project to all occupied California spotted owl territories, include greater use of prescribed fire to increase resiliency and heterogeneity as part of the restoration process, and minimize the effects of reforestation activities on the recovering ecosystem by reducing planting densities and avoiding herbicide use.

Thank you for your time and consideration. Please direct any questions or comments to Ben Solvesky (ben@sierraforestlegacy.org; 928-221-6102).

Sincerely,

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