CENTER *for* BIOLOGICAL

THE JOHN MUIR PROJECT
OF EARTH ISLAND INSTITUTE

January 23, 2015

Eldorado National Forest
Attn: King Fire Project
100 Forni Road
Placerville, CA 95667
FS-comments-pacificsouthwest-eldorado@fs.fed.us

Re: King Fire Project

Dear Eldorado National Forest,

On behalf of the John Muir Project of Earth Island Institute (JMP) and the Center for Biological Diversity (CBD), we are submitting these written scoping comments on the King Fire Project in addition to the oral comments we have provided in our discussions with Forest Supervisor Laurence Crabtree in October of 2014 and January 22, 2015 and with District Ranger Richard Thornburg on December 15, 2014.

In accordance with your request in the Public Meeting presentation we are submitting these comments in an effort to: address the Merits, Errors and Environmental concerns associated with the current proposal; to request that specific information be provide to the public and why said information should be included; and to encourage you to make changes to the project design in order to protect the rare, natural and ecologically important complex early seral forest created by the high intensity fire areas that are currently proposed for logging under the King Fire Project.

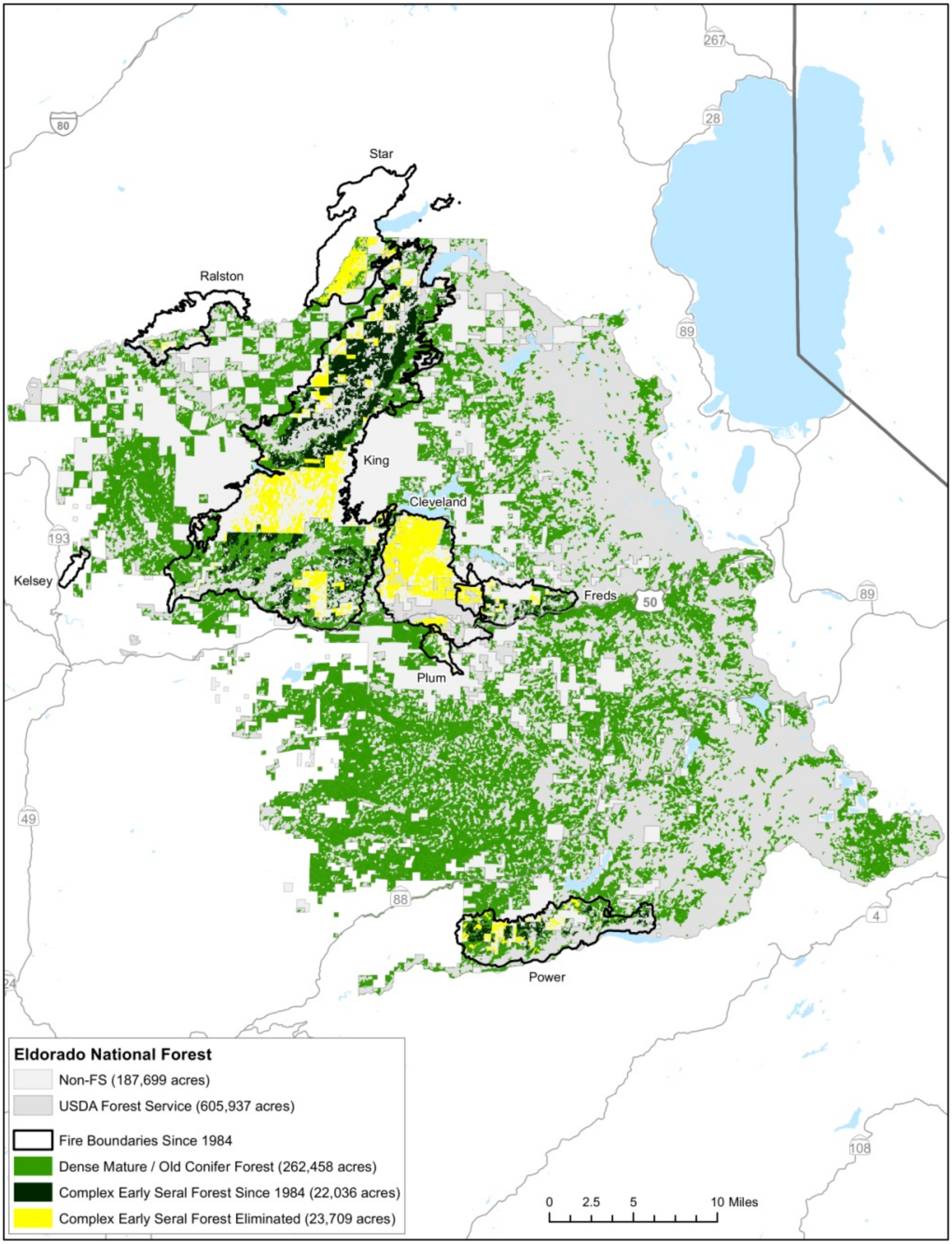
Comments Addressing the Merits, Errors and Environmental Concerns of the King Fire Project:

1) The Scoping Notice and Proposed Action do not Discuss the Ecological Importance of Complex Early Seral Forests nor Disclose its Lack of Abundance on the Eldorado National Forest.

Complex early seral forest (CESF), created by high-severity fire (75-100% mortality) occurring in pre-fire dense, mature/old conifer forest (pre-fire CWHR 4M, 4D, 5M, 5D, and 6), is the rarest, and generally most biodiverse and wildlife-rich, forest habitat type in western U.S. conifer forests, including the Sierra Nevada, and far more bird species associated with this habitat are declining than birds associated with unburned forest. See e.g., Baker 2014, Beaty and Taylor

2001, Bekker and Taylor 2001, Bekker and Taylor 2010, Bond et al. 2009, Bond et al. 2013, Buchalski et al. 2013, Burnett et al. 2010, 2011, Clark 2007, Clark et al. 2013, DellaSala et al. 2014; Ganey et al. 2014, Hanson 2013, Hanson 2014, Odion et al. 2014, Siegel et al. 2014a, 2014b, 2014c, Tingley et al. 2014).). The King Fire Project proposes to remove 14,000 acres of this habitat type and yet neither the public presentation nor the scoping documents disclose this fact and as a result does not inform the public of the ecosystem and biodiversity costs of logging the majority of this habitat type which was created by the King Fire.

This is especially troubling here because there is so little of this habitat type on the Eldorado National Forest. Currently, CESF comprises only about 3% of the Eldorado National Forest, and is 12 times rarer than mature/old conifer forest (CWHR 4M, 4D, 5M, 5D, and 6). **See Map on page 3.** Moreover, the great majority of the existing/remaining CESF on the Eldorado NF is in the King fire area, and most of this is proposed for removal under the current Proposed Action, which would threaten numerous species (Hanson 2014).


Star
Ralston
King
Cleveland
Kelsey
Freds
Plum
Power
80
267
28
89
193
50
89
49
88
4
24
108
Eldorado National Forest
Non-FS (187,699 acres)
USDA Forest Service (605,937 acres)
Fire Boundaries Since 1984
Dense Mature / Old Conifer Forest (262,458 acres)
Complex Early Seral Forest Since 1984 (22,036 acres)
Complex Early Seral Forest Eliminated (23,709 acres)
0 2.5 5 10 Miles

2) Diversity of birds associated with, depend upon or benefit from unmanaged mixed and high intensity fire in mature forests:

The project as proposed –removing approximately 14,000 acres of burned forest habitat, focused on the removal of complex early seral forest (mature forest that has burned at high intensity – would entail significant adverse environmental impacts, due to removal of important habitat for the black-backed woodpecker and California spotted owl, as well as wildlife that relies on post-fire shrub habitat. Research as to woodpeckers (e.g., Siegel et al. 2014a, Siegel et al. 2014b, Siegel et al. 2014c, Tingley et al. 2014, Seavey et al. 2012, Hanson and North 2008,) spotted owls (e.g., Bond et al. 2009, Bond et al. 2013, Clark 2007, Clark et al. 2013, Ganey et al. 2014), and avian species in general (e.g., Hanson 2014) demonstrates the importance of maintaining burned forest, especially intensely burned forest, on the landscape in its entirety instead of logging it. The targeted trees and/or shrubs are essential habitat for wildlife in a post-fire landscape. Indeed, the "snag forest habitat" areas created by high-intensity fire cannot be termed "deforested" or "destroyed" or lacking in value, instead they are essential aspects of a healthy forest including acting as the forest's nurseries for many if not most native bird species (DellaSala et al. 2014, Raphael et al. 1987, Burnett et al. 2010, Burnett et al. 2012).

California Spotted Owl

The Forest Service, based only upon studies which investigated how owls use green/unburned forest, considers suitable California spotted owl habitat as mature forest stands represented by CWHR classes 4M, 4D, 5M, 5D, and 6 in mixed conifer, red fir, ponderosa pine/ hardwood, foothill riparian/hardwood, and east-side pine forests. The last time the Forest Service formally adopted a definition of suitable habitat for spotted owls was in 2004, as part of the 2004 SNFPA. The SFNPA states the following as to suitable habitat:

> California spotted owl protected activity centers (PACs) are delineated surrounding each territorial owl activity center detected on National Forest System lands since 1986. Owl activity centers are designated for all territorial owls based on: (1) the most recent documented nest site, (2) the most recent known roost site when a nest location remains unknown, and (3) a central point based on repeated daytime detections when neither nest or roost locations are known.
>
> PACs are delineated to: (1) include known and suspected nest stands and (2) encompass the best available 300 acres of habitat in as compact a unit as possible. The best available habitat is selected for California spotted owl PACs to include: (1) two or more tree canopy layers; (2) trees in the dominant and co-dominant crown classes averaging 24 inches dbh or greater; (3) at least 70 percent tree canopy cover (including hardwoods); and (4) in descending order of priority, CWHR classes 6, 5D, 5M, 4D, and 4M and other stands with at least 50 percent canopy cover (including hardwoods). Aerial photography interpretation and field verification are used as needed to delineate PACs.

Desired Conditions

Stands in each PAC have: (1) at least two tree canopy layers; (2) dominant and co-dominant trees with average diameters of at least 24 inches dbh; (3) at least 60 to70 percent canopy cover; (4) some very large snags (greater than 45 inches dbh); and (5) snag and down woody material levels that are higher than average.

…

A home range core area is established surrounding each territorial spotted owl activity center detected after 1986. The core area amounts to 20 percent of the area described by the sum of the average breeding pair home range plus one standard error. Home range core area sizes are as follows: 2,400 acres on the Hat Creek and Eagle Lake Ranger Districts of the Lassen National Forest, 1,000 acres on the Modoc, Inyo, Humboldt-Toiyabe, Plumas, Tahoe, Eldorado, Lake Tahoe Basin Management Unit and Stanislaus National Forests and on the Almanor Ranger District of Lassen National Forest, and 600 acres of the Sequoia and Sierra National Forests.

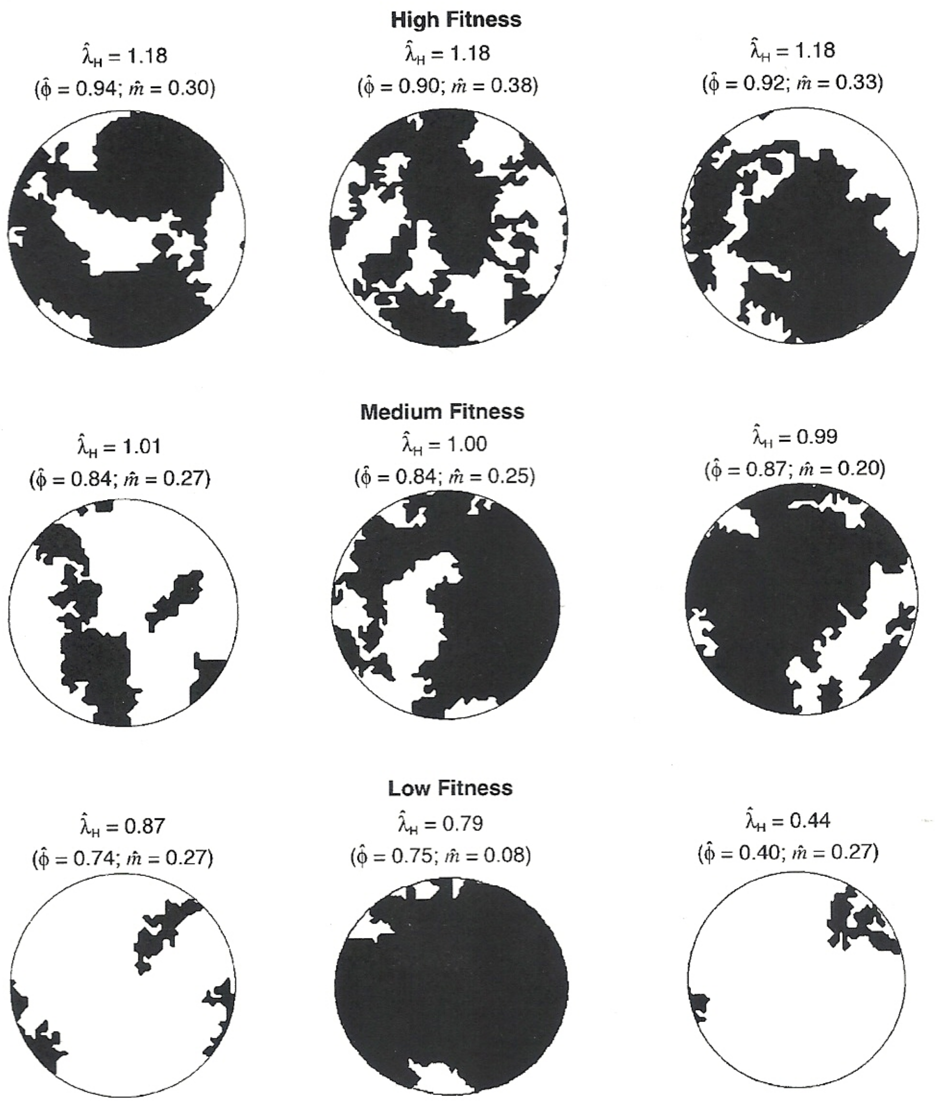
Aerial photography is used to delineate the core area. Acreage for the entire core area is identified on national forest lands. Core areas encompass the best available California spotted owl habitat in the closest proximity to the owl activity center. The best available contiguous habitat is selected to incorporate, in descending order of priority, CWHR classes 6, 5D, 5M, 4D and 4M and other stands with at least 50 percent tree canopy cover (including hardwoods). The acreage in the 300-acre PAC counts toward the total home range core area. Core areas are delineated within 1.5 miles of the activity center.

When activities are planned adjacent to non-national forest lands, circular core areas are delineated around California spotted owl activity centers on non-national forest lands. Using the best available habitat as described above, any part of the circular core area that lies on national forest lands is designated and managed as a California spotted owl home range core area.

HRCAs consist of large habitat blocks that have: (1) at least two tree canopy layers; (2) at least 24 inches dbh in dominant and co-dominant trees; (3) a number of very large (greater than 45 inches dbh) old trees; (4) at least 50 to 70 percent canopy cover; and (5) higher than average levels of snags and down woody material.

Because the Forest Service relies on the 2004 SNFPA for its management direction, the agency has never recognized the foraging habitat suitability of severely burned (and not salvage logged) forest stands for spotted owls and, in fact, regularly re-draws Protected Activity Centers (PACs), or even removes them from the PAC system, after severe fire to exclude these areas. The 2004 SNFPA facilitates this due to two key factors 1) its definition of suitable habitat and 2) because it explicitly states: “PACs are maintained regardless of California spotted owl occupancy status. However, after a stand-replacing event, evaluate habitat conditions within a 1.5-mile radius around the activity center to identify opportunities for re-mapping the PAC. If there is insufficient suitable habitat for designating a PAC within the 1.5-mile radius, the PAC may be removed from the network.”

The result is a lack of protection for suitable foraging habitat created when high intensity fire burns CWHR classes 4M, 4D, 5M, 5D, and 6 in mixed conifer, red fir, ponderosa pine/ hardwood, foothill riparian/hardwood, and east-side pine forests, and a failure to view a territory as a mini-ecosystem, where owl populations stabilize or increase as the heterogeneity within their territory increases. Franklin et al 2000 (finding that spotted owls only maintained stable or increasing populations when30-70% of their territory consisted of habitat created by fire (not even-age logging) consistent with complex early seral forest).



Franklin et al., 2000, Figure 10: (white areas = habitat consistent with complex early seral forest; black areas = dense mature/old forest).

The standards in the 2004 Framework also do not incorporate the most recent science regarding how owls use burned areas and how they respond to salvage logging in their territories. Bond et al. 2009, Bond et al. 2010, Bond et al. 2013, Lee et al. 2012, Ganey et al. 2014, and Clark et al.

2013 These studies demonstrate how spotted owls use burned forest and/or show the importance of protecting owls from salvage logging and yet this science continues to be downplayed or discounted based upon analysis done in green forest, not upon empirical evidence regarding owls use of burned areas or the effects of salvage logging on owl occupancy.

Bond et al. (2009) quantified habitat selection, which is how much owls used forest that burned at a particular severity compared with the availability of that burn severity. The authors banded and radio-marked 7 California spotted owls occupying the McNally Fire in the Sequoia National Forest four years after fire, and radio tracked them throughout the breeding season. Males and females forage independently, and analyses compared each bird's foraging locations with random locations within their own foraging ranges. Furthermore, all owls had unburned, low, moderate and highly burned patches of forest in their foraging ranges from which to choose, so the authors could quantify whether owls selected or avoided any of these burn intensities. This is the first study to specifically examine foraging habitat selection by spotted owls in burned forests that were not subjected to substantial post-fire logging. Spotted owls used all burn severities for foraging, but the probability of an owl using a site for foraging was strongest in severely burned forests, after accounting for distance from nest (see Figure 1 below). Selection for a particular burn class occurred within 1.5 km from the nest.

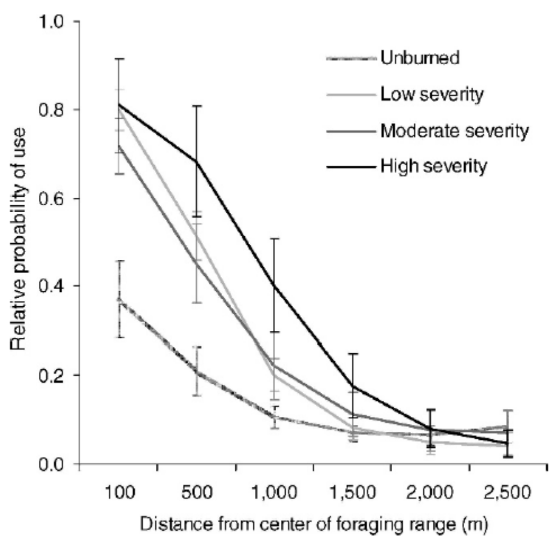


Figure 1. Relative probability of use of a site for 7 California spotted owls foraging at different distances from the center of the breeding range in forest burned at different intensities in the McNally Fire, Sequoia National Forest, 2006. From Bond et al. 2009; Figure 1 on page 1,121.

Bond et al. (2009) also measured vegetation and found that high-intensity burned sites had the greatest herb and shrub cover and basal area of snags. This result suggests that snags, herb, and shrub cover are important components of a post-fire forest that supports foraging habitat for spotted owls. Because severely burned, non-salvage-logged forests can offer suitable habitat for foraging spotted owls, the authors of Bond et al. 2009 recommended "that burned forests within 1.5 km of nests or roosts of California spotted owls not be salvage-logged until long-term effects of fire on spotted owls and their prey are understood more fully."

A more recent study on the Mexican Spotted Owl (Ganey et. al., 2014) found that spotted owls traveled far beyond their territory (up to 14km) in order to over winter in mixed intensity fire areas (such as the fire area created by the King Fire). In looking for an explanation for such behavior the study's authors determined that prey biomass was 2 to 6 times more abundant in the burned forest than in the owl's unburned old forest nest cores, making meals easier to get and survival more likely. This information helps to explain why Bond et al., 2009 found that if high intensity burned areas exist within 1500 meters of an owl's nest or roost site that the owl specifically seeks out these areas, over all others, for hunting.

Post-fire logging has a harmful effect on California spotted owls because it eliminates or degrades habitat that would otherwise be used. For example, Lee et al. (2012) reported that mixed-severity fire, averaging 32% high-severity fire effects, did not reduce occupancy of California spotted owl sites in the Sierra Nevada, and even most territories with >50% high-severity fire remained occupied (at levels of occupancy comparable to unburned forests). This, however, was not the case in salvage-logged sites, as every site that was salvage logged lost occupancy, even though they were occupied after the fire but before the salvage logging (Lee et al. 2012). Specifically, post-fire logging occurred on eight of the 41 burned sites; seven of the eight sites were occupied immediately after the fire but none were occupied after post-fire logging. While Lee et al. 2012 notes that this particular "sample size was too small for this effect to be included as a covariate," the results nonetheless are best available data regarding post-fire logging and California spotted owls. Moreover, a study of northern spotted owls is also illustrative: Clark et al. (2013) found post-fire salvage logging in high-severity fire areas was a factor in territory extinction of northern spotted owls (*S. o. caurina*) in southwestern Oregon ("Our results also indicated a negative impact of salvage logging on site occupancy by spotted owls. We recommend restricting salvage logging after fires on public lands within 2.2 km of spotted owl territories (the median home range size in this portion of the spotted owl's range) to limit the negative impacts of salvage logging.")

The Project must also keep in mind that California spotted owls are in a steep decline and therefore their viability is at extreme risk. Now outdated studies of California spotted owls strongly suggested population declines, but statistical power was too low to provide solid evidence. Recent scientific studies, however, using additional data and robust statistical methodology, have very clearly demonstrated that California spotted owl populations are declining throughout the range of the subspecies (Connor et al. 2013; Tempel and Gutierrez 2013). Over the past 18 years, a spotted owl population in the logged Lassen National Forest declined by 22% and another population in the logged Sierra National Forest declined by 16% (Conner et al. 2013). By contrast, in the same 18-year period a population in the unlogged national parks of Sequoia and Kings Canyon increased by 22%. In the logged Eldorado National Forest, (an area which overlaps significantly with the King Fire Project) the number of territories occupied by spotted owls <u>declined by about half over the course of just over two decades</u> (Tempel et al. 2014 [Figure 2]). None of these demography study areas experienced significant levels of fire during the study periods (except the Star fire of 2001 which comprised a small portion of the Eldorado Study area, and wherein only those territories which were post-fire logged lost occupancy) , thus fire could not be implicated as a factor in the population declines. These studies demonstrate that the California spotted owl is currently on a trajectory towards extinction on our public forest lands in the Sierra Nevada. Current regulatory mechanisms on public forest lands have permitted harmful forest management practices, such as salvage logging in owl habitat, and have proven inadequate to stabilize or reverse the population declines. The data therefore indicate that the California spotted owl is imperiled throughout most of its range, and logging in National Forest lands is an example of why local populations are threatened with extirpation and the entire subspecies may be on a trajectory towards range-wide extinction.

Moreover, because is it known that spotted owls rely on much more than Protected Activity Centers (PACs) for their life needs (nesting, roosting and foraging), it is necessary for the Forest Service to not only protect PACs and HRCAs from logging, but to also protect owl home ranges, including severely burned forest in home ranges. Further, most home-range estimates and studies of foraging habitat selection are from the breeding season only. Some California spotted owls are known to expand their movements during the winter (Bond et al. 2010, Ganey et al. 2014), which represents the most energetically costly and dangerous time for owl survival. Thus, the protection of potentially important habitat should extend to habitat that could be used during the overwinter season as well as the breeding season.

Here, a review of the GIS data which maps the proposed logging units and provides overlays of owl locations in relation to these logging units demonstrates a significant overlap between logging and owl detections. However, your presentation to the public, nor your scoping documents do not discuss and incorporate that moderate to high severity burn areas provide not only suitable, but *essential* foraging habitat for owls (Bond et al. 2009, Bond et al. 2013, Ganey et al. 2014). In other words, simply because an area is not preferred *roosting* habitat anymore does not mean it is not extremely valuable to owls as *foraging* habitat. This is not an either or situation and instead this critical foraging habitat should be protected because it too is limiting to owl survival. For example, loss of spotted owl occupancy has been documented in areas where owl *foraging* habitat was logged post-fire (Lee et al. 2012, Clark et al. 2013). Consequently, it is not appropriate to conduct salvage logging or reforestation in owl home ranges or wintering habitat and it is especially problematic to promote logging as a benefit to owls when in fact it is a detriment to owls when it occurs in a way that results in loss of preferred foraging habitat (i.e., the logging of intensely burned areas within an owl's territory and/or the eradication of post-fire shrub growth [such as via herbicides or mastication]). All intensely burned forest, that pre-fire was mature forest, is suitable habitat for owls (and in fact is selected for—see not only Bond et al. 2009 but also Clark 2007, Figure 6.2 showing more use than available of NSF [pre-fire mature forest] and Ganey et al. 2014) and is in fact preferred foraging habitat and must be treated as such. This is especially so in light of the current trajectory of owls in the Sierras—a serious decline on Forest Service and private lands. We note that the Forest Service itself recognizes that California spotted owl home ranges are 2,500 to 4,700 acres in size, and the 300-acre "PACs alone are not an adequate conservation strategy for maintaining a viable population of owls." 2001 Sierra Nevada Forest Plan Amendment, Final EIS, Vol. 3, Chapter 3, Part 4.4, pp. 75, 85.

Because the California Spotted Owl is in significant decline on this forest, is a Forest Service Sensitive Species, is a Management Indicator Species, and has recently been petitioned for listing under the Endangered Species Act [Petition to List the California Spotted Owl as Threatened or Endangered and Appendicies] every effort needs to be made when planning this project to ensure that loss of occupancy does not result from the proposed logging. This fire has also created a unique opportunity to study how a declining population of spotted owls responds to fire, and whether, as Franklin et al., 2000 found, an increase in heterogeneity will result in a stabilization or increase in owl populations. Given the abundance of private lands post-fire logging that has occurred post King Fire, maintaining all habitat within owl territories would be essential to fully assess how the owls respond to this fire.

Black-backed woodpecker

With black-backed woodpeckers, new science even more strongly demonstrates the importance of maintaining very high snag basal area post-fire – "As snag basal area increased, home-range sizes exponentially decreased" (Tingley et al. 2014). Tingley et al. 2014 explains that "an average snag basal area > 17 meters squared per hectare may represent a benchmark for minimum habitat needs in postfire stands," and that "[o]ur results, in combination with studies that have shown that black-backed woodpeckers are extremely sensitive to salvage logging (Hutto 2008, Saab et al. 2009), suggest that **currently the best strategy for protecting black-backed woodpecker habitat is to maintain large patches of high snag densities (Dudley and Saab 2007, Russell et al. 2007)".** Tingley et al., 2014 *emphasis* added. Nesting habitat was found to have over twice this "minimum" level of snag basal area, as was foraging habitat actually selected by the black-backeds (Siegel et al. 2013). Moreover, "the strength of the association of Black-backed Woodpeckers with unlogged postfire snag conditions makes it a useful indicator species for wildlife associated with this habitat." (Hanson and North 2008).

In addition, science published very recently – Siegel et al. 2014c – states the importance of protecting not only very high snag basal area but also those "snags with burned-out hollows, forked trunks, or other relatively unusual structures that may create crevices or other opportunities for shelter" for the woodpeckers.

In regard to specific habitat types, the following has been determined re BBWOs and must therefore be incorporated into the Projects:

- **Foraging habitat/Roosting habitat**: "Our past findings (Siegel et al. 2013) show that Black-backed Woodpeckers in burned forests of California preferentially select larger, dead trees in more severely burned areas for foraging; our findings here extend those same habitat selection criteria to another aspect of Black-backed Woodpecker habitat selection: roosting habitat." (Siegel et al. 2014a, 2014c).

- **Food:** "Black-backed Woodpeckers foraging in burned forests feed primarily on wood-boring beetle larvae (Villard and Beninger 1993, Murphy and Lehnhausen1998, Powell 2000), although some studies have also reported or inferred foraging on bark beetle larvae (Lester 1980, Goggans et al. 1988). Bark beetles and wood-boring beetles share important life-history characteristics (both spend a prolonged portion of their life-cycle as larvae inside dead or dying trees) but also exhibit differences that may be important in their ecological interactions with Black-backed Woodpeckers. Bark beetles are small (generally <6 mm in length), numerous, often able to attack live trees, and generally remain as larvae in bark less than a year before emerging as adults (Powell 2000). In contrast, wood-boring beetles have much larger larvae (up to 50 mm long), are less numerous, and can remain as larvae in dead wood for up to three years (Powell 2000).

Additionally, most wood-boring beetles are unable to attack living trees, and concentrate heavily in fire-killed wood . . . .” (Siegel et al. 2014b). Given that Black-backed Woodpeckers eat approximately 13,500 wood boring beetle larvae per year conservation of large patches of larger dead trees is essential to maintain territories, reproduction and survival.

- **Nesting habitat**: “For the 31 nests [we studied], the mean number of snags/plot was 13.3 (SD ¼ 7.6, range ¼ 1–29 snags/plot), whereas the mean number of snags on plots at randomly selected trees was 5.0 (SD ¼ 5.2, range ¼ 0–35 snags/plot). Seavy et al. 2012. Translated, this means that within 1/10th acre surrounding the nest tree there existed on average 13.3 snags, significantly higher than randomly selected plots which only had on average 5 snags per 1/10th acre. In both the Cub Fire and Moonlight Fire sites, black-backed woodpeckers preferred nest trees located in areas with high snag densities (Fig. 3).” (Seavy et al. 2012); “None of the cavities were re-used between years and each appeared to have been freshly excavated in the year of its use.” (Seavy et al. 2012); “For the 31 nest trees measured, the mean dbh was 33 cm (SD ¼ 7, range ¼ 18–50)” (Seavy et al. 2012).

Important Factors re BBWOs:

- **Colonization and extinction**: Black-backed woodpecker use of and persistence in burned forest areas is strongly and positively associated with high fire severity and high snag densities: “. . . extinction occurred less frequently at survey points with greater burn severity. Colonization . . . had very strong relationships to two covariates. Colonization was more likely at early post-fire points and at points with high densities of snags. ” (Siegel et al. 2014b)

- **Home Range size**: “[W]e found that home-range size varied by an order of magnitude, from 24.1 to 304.1 ha, as measured by movement-based kernel estimation” (Tingley et al. 2014); “Black-backed Woodpecker home ranges within our 3 fires varied by approximately an order of magnitude, and this variation was explained in large part by a single resource characteristic: mean snag basal area” (Tingley et al. 2014); “However, size [of a home range] appears to vary with habitat type and time since fire (Dudley and Saab 2007, Rota et al. 2014). As populations of wood-boring beetle larvae decrease during the years after fire (McCullough et al. 1998), it is believed that Black-backed Woodpeckers enlarge their home ranges before eventually abandoning individual burned areas altogether (Dudley and Saab 2007, Rota et al. 2014).” (Tingley et al. 2014)

Given that “the best strategy for protecting black-backed woodpecker habitat is to maintain large patches of high snag densities,” and given the importance of very high snag density to nest sites, foraging sites, and home range size, it is imperative, and we therefore request, the vast majority of areas which consist of mature conifer forest pre-fire (CWHR 4M and above), and burned at moderate to high intensity be protected. Given that Black-backed woodpecker habitat is ephemeral (only remains suitable for 6-10 years post-fire) the King Fire represents nearly all of what remains of suitable Black-backed woodpecker habitat on the Eldorado National Forest and represents all of the highest quality habitat for this species on this Forest. We recommend that

Tingley et al. (2014) be utilized to identify the best habitat on the Forest, to be verified by actual field studies, and that at least 75% of the pairs on the national forest be preserved, prioritizing the pairs in the highest quality habitat for protection. In addition, consistent with the recommendations of the Forest Service's own black-backed woodpecker Conservation Strategy (Bond et al. 2012), post-fire logging during black-backed woodpecker nesting season (May 1 – July 31st) should not be permitted.

Additional Information Regarding Wildlife and the Post-Fire Landscape

The lack of specificity and precision as to old forests and complex early seral forest in the Projects will only lead to confusion and likely harm to wildlife. The details are important because the Forest Service is using general language to argue, for example, for logging post-fire early seral areas under the guise of more quickly returning the areas to "old forest." That approach is not scientifically sound as it does not acknowledge that the journey is just as important as the destination in regard to forest succession (e.g., Donato et al. 2012). Old forest derives from early forest in the sense that important components, like snags, downed wood, shrubs, and natural heterogeneity (from natural regeneration) derive, in large part, from complex early seral forest (e.g., Swanson et al. 2011, DellaSala et al. 2014). Put another way, it does not make sense to achieve ecological integrity by destroying complex early seral forest to more quickly achieve old forest – instead, both are damaged ecologically in such an effort. Moreover, the Forest Service's stated approach fails to recognize that complex early seral forest, created by high-severity fire, is even rarer than old forest, is as biodiverse—or more biodiverse—than mature/old forest, and is much more threatened since there are no meaningful protections for this habitat, and associated wildlife, in forest plans or under the 2004 Framework forest plan (DellaSala et al. 2014, Hanson 2014).

Similarly, it is essential that the Forest Service use its platform to educate the public about the importance of intensely burned forest to wildlife. Again, we recognize that it is important to protect the public from hazard trees, but it is also essential to educate the public about the ecological role of intensely burned forest—the public can best appreciate something when they are well informed about it, and here it is critical to educate about wildlife and burned forest in light of past attacks by the Forest Service on intense fire.

Unfortunately, there also continues to be a generic argument that severe fire is to blame for loss of old forest. There is no basis for this argument as severe fire is currently in a deficit in the Sierras and is especially lacking on the Sierra Forest. Severe fire is also not an either/or. For many species, whiles severe fire changes their landscape, it can nonetheless continue to provide key habitat, albeit in a different form. Again, California spotted owls have been found, on the Sequoia National Forest after the McNally Fire, to preferentially select the mature conifer forest that burned severely for their foraging needs. Similarly, fishers have been found on the Sequoia National Forest to use severely burned mature conifer forest (Hanson 2013). And, of course, many species, such as the black-backed woodpecker, rely on these severely burned forests for high quality habitat, and are keystone species in that they create cavities for other birds and animals to use down the line (Manley and Tarbill 2012, Tingley et al. 2014, Siegel et al. 2014a, 2014b). In fact, many of the fires that the Forest Service points to as being uncharacteristic are fires that have been found to support great biodiversity, except in or near to areas where salvage logging has occurred – e.g., the Angora, the Storrie, the Moonlight, the McNally. There is strong evidence for this, namely, Bond et al. 2009, 2013; Buchalski et al. 2013; Burnett et al. 2010, 2012; Hanson and North 2008; Hanson 2013; Malison and Baxter 2010; Manley and Tarbill 2012; Seavy et al. 2012; Siegel et al. 2011, 2013, 2014a, 2014b, 2014c.

Also neglected is the fact that conifer forests of the Region rely on fire of all severities to maintain ecosystem integrity and wildlife diversity, but currently, these forests are in an extreme fire deficit of all severities. (See, e.g., Beaty and Taylor 2001, Bekker and Taylor 2001, Bekker and Taylor 2010, Miller et al. 2012, Odion and Hanson 2013, Mallek et al. 2013, Hanson and Odion 2014, Odion et al. 2014, Baker 2014.) This fire deficit means that, generally speaking, when fires do occur, they are restorative events because they return fire and its ecological value to the landscape, providing, for example, essential (and very rare) wildlife habitat as already described above. And, contrary to assumptions, large, high-severity fire patches are not homogenous—rather, they can contain stand level heterogeneity because they vary in size and importantly, contain within them high levels of variation in regard to post-fire vegetation and snags.

In addition, Siegel et al. (2011) explains that not only black-backed woodpeckers, but many other species, are utilizing complex early seral forest left unlogged: "Many more species occur at high burn severity sites starting several years post-fire, however, and these include the majority of ground and shrub nesters as well as many cavity nesters. Secondary cavity nesters, such as swallows, bluebirds, and wrens, are particularly associated with severe burns, but only after nest cavities have been created, presumably by the pioneering cavity-excavating species such as the Black-backed Woodpecker. Consequently, fires that create preferred conditions for Black-backed Woodpeckers in the early post-fire years will likely result in increased nesting sites for secondary cavity nesters in successive years." Similarly, Burnett et al. (2012) found that "while some snag associated species (e.g. black-backed woodpecker) decline five or six years after a fire [and move on to find more recent fire areas], [species] associated with understory plant communities take [the woodpeckers'] place resulting in similar avian diversity three and eleven years after fire (e.g. Moonlight and Storrie)." Burnett et al. (2012) also noted that "there is a five year lag before dense shrub habitats form that maximize densities of species such as Fox Sparrow, Dusky Flycatcher, and MacGillivray's Warbler. These species have shown substantial increases in abundance in the Moonlight fire each year since 2009 but shrub nesting species are still more abundant in the eleven year post-burn Storrie fire. This suggests early successional shrub habitats in burned areas provide high quality habitat for shrub dependent species well beyond a decade after fire." And Manley and Tarbill (2012) found, in the post-fire area of the Angora fire (before it was logged), that woodpeckers play a keystone role that can only be accomplished when post-fire habitat is maintained, not logged:

> Although woodpecker species differed in their influence on recovery of birds and small mammals, all three species observed in our study played an important role in supporting the cavity-dependent community through habitat creation for nesting, resting, denning, and roosting. The Black-backed Woodpecker was a significant contributor to the establishment of bird and small mammal species and communities in areas with high burn intensities, and it appeared to have a more narrow range of suitable habitat conditions for nest site selection compared to the

> Hairy Woodpecker. Thus, the habitat requirements of the Black-backed Woodpecker serve as a useful threshold for managing burned sites for wildlife recovery.

It is therefore imperative that Projects such as this one conserve the ecological integrity of post-fire, complex early seral habitat, especially the key characteristics, such as high snag density, extensive shrub cover, downed wood, and natural conifer regeneration.

New literature continues to demonstrate our points. In Hanson 2014, "Conservation concerns for Sierra Nevada birds associated with high-severity fire," the analysis found that all of the native Sierra Nevada birds positively associated, in the published scientific literature, with post-fire habitat created by high-intensity fire, and which have statistically significant population trends (Breeding Bird Survey), are experiencing persistent and ongoing declines. These declines of high-intensity fire associates are affecting all nesting guilds, including cavity nesters, canopy nesters, and shrub/ground nesters, the latter of which comprised the largest number of declining species. The study identified post-fire logging, and subsequent removal/eradication of native shrubs (through mechanical means and spraying of toxic herbicides) and artificial conifer plantation establishment, as well as ongoing fire suppression and mechanical thinning designed to further suppress fire, as serious threats and recommended a major change in current management direction to conserve these species and their habitat.

In DellaSala et al. 2014. "Complex early seral forests of the Sierra Nevada: what are they and how can they be managed for ecological integrity?" the authors synthesized and summarized the existing scientific literature, and recommended that "Complex Early Seral Forest" (CESF) be recognized as an ecologically distinct forest habitat type, and that CESF should be mapped and monitored, and protected from post-fire logging. The authors also found that the Black-backed Woodpecker should be designated as a Species of Conservation Concern under the revised forest plans, due to its extreme rarity and vulnerability to further fire suppression and post-fire logging operations. Additionally, the authors recommended an expansion of mixed-intensity managed wildland fire to restore CESF on the landscape, given that the current science shows CESF to be in a substantial deficit relative to historical levels. This study provides important guidance for the Forest Service as to CESF.

Finally, the initial findings of Fogg et al., 2014, an avian study being conducted in the Rim Fire Area (a much larger fire than the King Fire) illustrates the abundance and biodiversity of avian species in snag forest (i.e., complex early seral forest) even one year after a mixed intensity fire (*see* abstract below).

SHORT TERM CHANGES IN AVIAN COMMUNITY COMPOSITION WITHIN THE SIERRA NEVADA\'S MASSIVE RIM FIRE

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The Rim Fire ignited August 2013 in a remote area of the Stanislaus National Forest ultimately burning 62,536 hectares of National Forest System lands. The largest recorded fire in the Sierra Nevada, the area now harbors snag forest and early successional habitat that is important to many bird species and rare across the Sierra landscape. During May-June 2014, we established 281 point count locations within conifer forest that burned predominantly at moderate to high severity in the Rim Fire. We compared avian abundances in the Rim Fire to 204 point count locations in adjacent central Sierra Nevada green forest. Woodpeckers, aerial flycatchers and seed-eaters, such as Hairy Woodpecker, Western Wood-Pewee and Lazuli Bunting had much greater abundance in the Rim Fire compared to nearby green forest. Birds that primarily use the canopy and understory, including Cassin's Vireo, Dusky Flycatcher and Nashville Warbler had far lower abundance in the Rim Fire. Black-backed Woodpecker, White-breasted Nuthatch, Western Bluebird and Lawrence's Goldfinch inhabited the Rim Fire but were absent or nearly absent from adjacent green forest. Results from this first year indicate a rich habitat for early-successional birds that will sustain these rarer species on the Sierra landscape for years to come.

3) The Scoping Notice and Proposed Action Do Not Describe a Project Consistent with Ecological Resilience

The Scoping Notice and Proposed Action claim that the near-clearcutting of thousands of acres of rare and biodiverse CESF somehow promotes forest "resilience". This is not consistent with the ecological concept of resilience. Ecological resilience pertains to the natural disturbance processes, and the varied habitat types and natural successional stages associated with such natural disturbance, which maintains viable populations of the full range of native biodiversity in the ecosystem, according to the United Nations Convention on Biological Diversity (Thompson et al. 2009). Given the extreme rarity of CESF on the Eldorado National Forest, the overall deficit of high-severity fire in Sierra Nevada forests relative to historical levels according to most studies (e.g., Hanson and Odion 2013, Baker 2014, Hanson and Odion 2014, Odion et al. 2014, Hanson and Odion in press), and the fact that native species associated with CESF are declining at disproportionately high levels relative to those associated with unburned forest (Hanson 2014), describing the removal of a high proportion of the vast majority of CESF on the entire Eldorado National Forest as promoting "resilience" is inaccurate and is highly misleading for the general public.

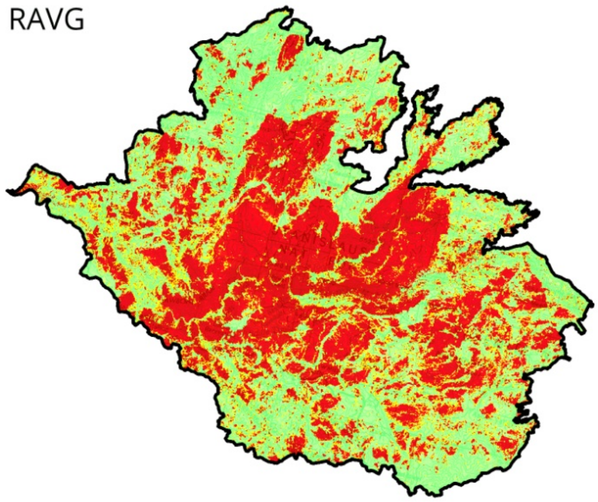
The photos below (page 16) depict the resiliency of high intensity fire patches in the Star Fire of 2001 which were not logged or replanted. Photos taken in 2013, 11 years post fire.

4) In Forests with a Strong Ponderosa Pine Component (such as exists in the King Fire Area), the Preliminary "RAVG" Fire Severity Assessment System Often Grossly Overestimates High-Severity Fire Proportions and Patch Sizes.

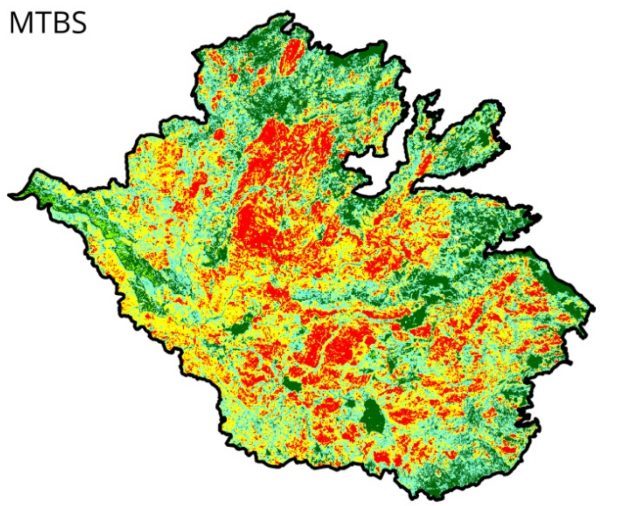
The RAVG system uses satellite imagery from just several weeks after the fire is out, which means that it cannot possibly account for the effects of "flushing"—a process through which pines with high to complete (100%) crown scorch (i.e., no remaining green needles) produce new green needles the year after the fire from surviving terminal buds (Hanson and North 2009). Many trees that initially appear to be dead are, in fact, not dead, in other words (see photo below showing early-stage flushing in ponderosa pines in the Rim fire, May 1, 2014 [photo taken by Chad Hanson]). This occurred pervasively in the Rim fire in the spring and summer of 2014.

This effect is often substantial. For example, in the Rim fire, the preliminary RAVG system estimated about 40% high-severity fire, while the final fire severity assessment by MTBS (Monitoring Trends in Burn Severity, conducted jointly by the U.S. Geological Survey and U.S. Forest Service), which was based upon satellite imagery taken in the summer of the year after the fire, concluded that there was actually only 20% high-severity fire (MTBS defines high-severity fire as 75-100% mortality of overstory (dominant and codominant) trees, consistent with standard definitions). Further, while RAVG made it appear as if there was one large high-severity fire patch over 60,000 acres in size, the final MTBS data and mapping showed that this was incorrect, and that there were many smaller patches (ranging from fractions of an acre, to dozens or hundreds of acres, and a small number of patches about 1,000 to 3,000 acres in size—each of which has numerous low/moderate-severity inclusions within its boundaries), as the comparison figure below (page 18) shows.

RAVG



MTBS

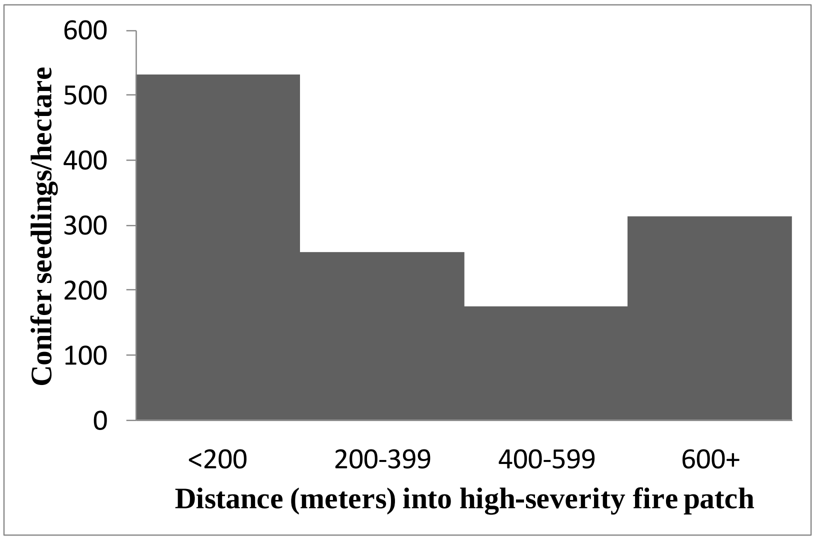


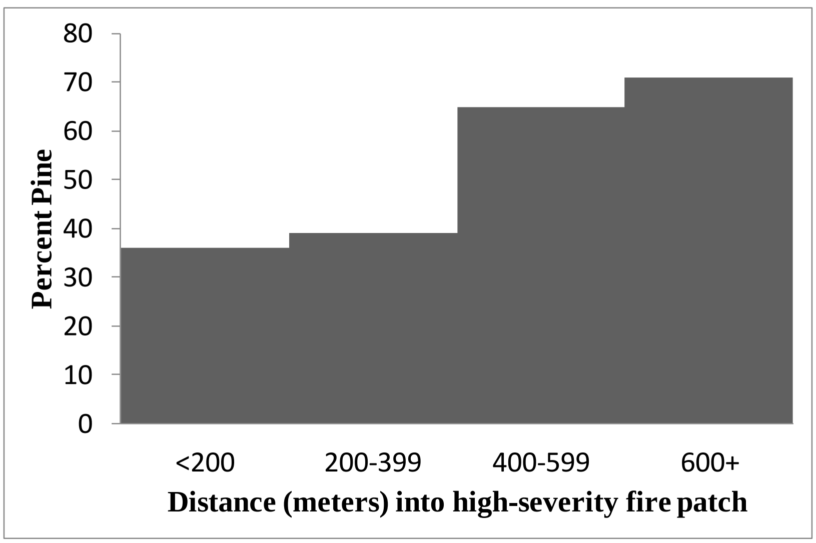
This is a very important lesson for the King fire, since the current RAVG mapping represents that there is a high-severity fire patch that appears to be around 30,000 acres in size, and the Proposed Action is largely based upon the assumption that this is accurate, and that there is essentially 100% tree mortality in this area. This is highly unlikely, in light of the strong potential for flushing in much of this 30,000-acre area, given large expanses of mature forest with brown needles (trees that are mostly not dead, and will flush) rather than black needles to the tops of the trees (i.e., trees that experienced active crown fire, and will not flush and survive, Hanson and North 2009), as well as numerous areas with green trees in this patch (see photos below [page 19], taken by Chad Hanson in the fall of 2014 in the 30,000-acre area in question within the King fire).




5) Substantial Natural Post-fire Conifer Regeneration Occurs in Large High-Severity Fire Patches in Mixed-Conifer and Ponderosa Pine Forests

Most research has found significant natural conifer regeneration in high-severity fire patches, including in larger patches hundreds of meters from the nearest low/moderate-severity edge, and shrub cover has not been found to preclude such regeneration, contrary to common U.S. Forest Service assumptions (Shatford et al. 2007, Donato et al. 2009, Crotteau et al. 2013). One Forest Service study, Collins and Roller (2013), reported relatively little natural conifer regeneration in high-severity fire patches, but our on-the-ground investigation of their plot locations revealed that most of those that had not been post-fire logged had been pre-fire clearcut (i.e., there were few if any mature trees even before the fires) or were in natural non-conifer vegetation, such as black oak forests. Dr. Chad Hanson's surveys in the largest high-severity fire patches in the Rim fire have also found substantial natural conifer regeneration, especially pines (see figures below).





©Hanson December 2014: Photo of typical natural post-fire conifer regeneration deep inside a large high-severity fire patch north of the Tuolumne River.

©Hanson 2014: Natural post-fire conifer regeneration, and high ground cover, over 400 meters into large high-severity fire patches in the Rim fire, December of 2014.

The assumption, expressed in the Scoping Notice and Proposed Action, that natural conifer regeneration will essentially not occur beyond a short distance into high-severity fire patches is simply not consistent with the evidence.

In addition, natural regeneration is critical to allowing for heterogeneity and post-fire wildlife habitat. Siegel et al. (2011) concluded that native fire-following shrubs are vitally important to biodiversity in complex early seral forest (CESF) created by high-intensity fire: "Many more species occur at high burn severity sites starting several years post-fire, however, and these include the majority of ground and shrub nesters as well as many cavity nesters. Secondary cavity nesters, such as swallows, bluebirds, and wrens, are particularly associated with severe burns, but only after nest cavities have been created, presumably by the pioneering cavity-excavating species such as the Black-backed Woodpecker. Consequently, fires that create preferred conditions for Black-backed Woodpeckers in the early post-fire years will likely result in increased nesting sites for secondary cavity nesters in successive years." Similarly, Burnett et al have found that shrub dominated landscapes are critically important wildlife habitat: "while some snag associated species (e.g. black-backed woodpecker) decline five or six years after a fire [and move on to find more recent fire areas], [species] associated with understory plant communities take [the woodpeckers'] place resulting in similar avian diversity three and eleven years after fire (e.g. Moonlight and Storrie)." (Burnett et al. 2012). Burnett et al. (2012) also noted that "there is a five year lag before dense shrub habitats form that maximize densities of species such as Fox Sparrow, Dusky Flycatcher, and MacGillivray's Warbler. These species have shown substantial increases in abundance in the Moonlight fire each year since 2009 but shrub nesting species are still more abundant in the eleven year post-burn Storrie fire. This suggests early successional shrub habitats in burned areas provide high quality habitat for shrub dependent species well beyond a decade after fire." (Burnett et al. 2012). Moreover, natural conifer regeneration is generally substantial following high-severity fire—even in large patches—and native shrub cover does not inhibit natural conifer regeneration (Shatford et al.

2007, Crotteau et al. 2013), while post-fire logging kills most of the existing natural conifer regeneration (Donato et al. 2006).

Replanting is expensive and it is not necessary to regenerate a forest. It is also not typically successful in logged areas (e.g. Power fire replanting). As proposed here, replanting would require the removal of native shrubs and grasses (through hand clearing and or herbicides) removing a native vegetation component necessary to the health and biodiversity of the forest.

6) The Empirical Evidence Concludes that Post-fire Logging is Not Effective in Reducing Future Fire Intensity

The Scoping Notice and Proposed Action assume that post-fire logging will effectively reduce future fire intensity and severity, and propose a large-scale "fuel break" on a ridge based upon this assumption. While every U.S. Forest Service post-fire logging project EA or EIS contains a "fuels" section that projects—based upon Forest Service modeling assumptions—reduced future fire intensity in post-fire logged areas, the actual published scientific evidence does not support this modeling assumption (Donato et al. 2006, Thompson et al. 2007, Donato et al. 2013). The Forest Service must candidly disclose and acknowledge that the actual scientific evidence does not support its assumptions in this regard.

7) The Empirical Evidence Concludes that Post-fire Logging Does Not Reduce Sedimentation/Erosion

The Forest Service has also stated an assumption that post-fire logging will reduce erosion and sedimentation. However, this is also contradicted by the scientific evidence, which usually finds a dramatic increase in erosion/sedimentation from post-fire logging, relative to no logging (Karr et al. 2004, Wagenbrenner et al. 2015).

8) Ground Cover Assertions Made Before the First Post-fire Spring are Not Credible

A common assertion in EAs or EISs for post-fire logging projects is that high-severity fire areas lack ground cover. In nearly every case, this is based upon mere assumptions made in the early spring when most draft EISs are released. However, this is among the many reasons why the Forest Service should wait several additional weeks to release a DEIS, given that ground cover is heavily influenced by the typically dramatic growth of new vegetation (shrubs, grasses, oaks, and conifers) beginning in the mid-spring of the first year post-fire. This was very much the case in the large high-severity fire patches in the Rim fire, for example. In light of this, we urge the Forest Service to wait until late spring to release a DEIS (which will also allow the Forest Service to determine the extent of "flushing", and initial conifer regeneration, without having to guess), and we caution against assumptions about lack of ground cover—assumptions that have consistently been found to be untrue by mid-year in the first post-fire year. *See photos above*.

Specific Information which should be Included in the DEIS and Why:

1) Not all burned forest is created equally. Mature Forest that burns at high intensity (also known as Complex Early Seral Forest) is the rarest and most biodiverse of forest types. Since only CESF is being targeted for removal, in order to accurately disclose how much of this habitat will be lost through logging you should compare the acres of CESF removed to the acres of CESF which actually (based upon 2015 flushing of trees) exist in the project area, and not to the total acres of national forest land that burned (or worse yet the total number of acres within the fire area). Making an improper comparison (as appears in the scoping notice comparing acres in project area (63,000) to acres proposed for logging (14,000)) inappropriately minimizes the effects of logging over 50% of the best wildlife habitat which exists in the fire area (CESF), and divests the public of knowledge central to their evaluation of and participation in the decision making process.

2) Acknowledge that CESF is suitable spotted owl foraging habitat and disclose to the public how much of this spotted owl habitat will be removed by the logging, especially within 1.5 kilometers of historic and current owl sites. It would be most helpful if you would provide detailed maps that clearly show the historic and current owl territories within the fire area and which depict how the proposed logging units intersect with those owl territories (i.e., at least 1.5km radius of any owl sites). We also request that you perform spotted owl surveys to protocol and provide the details of the surveys to the public in the NEPA documents.

This information is necessary in order for the public and the agency to be fully informed as to the effects of the Project on the declining California spotted owl population which reside within the Eldorado Study Area, a portion of which was burned in the King Fire.

3) Identify all of the moderate and high quality habitat which exists in the project area for the Black-backed Woodpecker based upon Tingley et al. (2014), and divulge the proportion proposed for logging, including the proportion of pairs. Please provide detailed maps which show the suitable habitat (as assessed after 2015 flushing) and how those acres would be impacted and fragmented by the proposed logging. This information is central to a proper understanding of the impacts this project would have on the Black-backed woodpecker.

4) It is important that flushing be addressed and incorporated into the discussion and analysis of the Project and the post-fire area so as to most accurately reflect conditions as they change over time due to the flushing that is likely to occur in the spring and summer of 2015 and thereafter (see Hanson and North 2009; see also Rim fire RAVG versus Rim fire MTBS [inserted above]);

Recommended Changes to the King Project Design:

Due to significant adverse impacts to the complex early seral forest habitat created by high intensity fire in the King Fire burn area and the myriad wildlife which depends upon and benefits from this habitat type, coupled with how little unmanaged CESF actually exists on the

Eldorado National Forest, we respectfully request that the King Fire Project be modified to only remove true hazard trees that are necessary to protect the public on roads maintained for public use (level 3, 4 and 5 roads) or administrative facilities/infrastructure (campgrounds/ buildings, etc.) and forego all other post-fire logging.

If the above is not a consideration that you are willing to make then we request that any logging proposal avoid the following areas.

- That no areas within 1.5 km of a spotted owl site be protected from logging (except the hazard tree felling described above) and that the 1.5 km areas incorporate owl surveys conducted in 2015 so as to be most reliable for habitat conservation (see Bond et al. 2009);

- Given that Black-backed woodpecker habitat is ephemeral (only remains suitable for 6-10 years post-fire) the King Fire represents nearly all of what remains of suitable Black-backed woodpecker habitat on the Eldorado National Forest and represents all of the highest quality habitat for this species on this Forest. We recommend that Tingley et al. (2014) be utilized to identify the best habitat on the Forest, to be verified by actual field studies, and that at least 75% of the pairs on the national forest be preserved, prioritizing the pairs in the highest quality habitat for protection. In addition, consistent with the recommendations of the Forest Service's own black-backed woodpecker Conservation Strategy (Bond et al. 2012), post-fire logging during black-backed woodpecker nesting season (May 1 – July 31st) should not be permitted.

- No logging in CESF should be allowed during nesting season to protect other declining bird species associated with this habitat type (generally from April –August) (Hanson 2014).

- Ensure that if some logging is approved that nesting season will be avoided even if logging is permitted beyond 2015.

- Do not rely on the outdated portions of the 2004 Sierra Nevada Forest Plan Amendment (2004 Framework), which ostensibly permit the logging contemplated in this Project. The Amendment was prepared long before the bulk of science regarding the importance and rarity of post-fire habitat was conducted. As such it is not reliable regarding post-fire actions due to this significant new information regarding the importance of burned forest habitat for wildlife, especially imperiled wildlife such as the California spotted owl and black-backed woodpecker.

- Adjust the timing of the Project analysis. As described herein there is information vital to an accurate and thorough analysis of impacts that simply will not be available prior to the anticipated release date for the DEIS (mid-late March 2015). This includes information on where imperiled species are residing (BBWO and CSO), the true amount of high intensity fire within the project area (flushing), the extent of ground cover and natural conifer regeneration. Not only will the public participation be impacted by not having these facts, but the analysis by the agency will be deficient as well. We recommend that you not release the DEIS until at least until June of 2015, and/or allow an official comment period on the FEIS, and/or allow an objection period prior to the commencement of logging. This would ensure that the public is fully informed and can meaningfully participate in the NEPA decision making process and would enable the Forest Service to make a decision based upon an accurate site-specific analysis.

- Do not replant or eradicate shrubs in high severity areas which are not logged. See e.g., Hanson 2014.

Sincerely,

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