CENTER for BIOLOGICAL

THE JOHN MUIR PROJECT
OF EARTH ISLAND INSTITUTE

April 13, 2015

Stanislaus National Forest
comments-pacificsouthwest-stanislaus@fs.fed.us

Re: Rim Reforestation Project

Dear Stanislaus 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 Rim Reforestation Project. The Project as proposed is antithetical to biodiversity and wildlife conservation because, for example, it would eliminate important and essential shrub habitat, would rely on herbicides in part to achieve its ends, and would harm natural post-fire conifer regeneration. Moreover, the Project contradicts the best available science.

a. **Native shrub habitat is rare and is essential to biodiversity and wildlife conservation**: The best available science demonstrates that post-fire shrub habitat should be allowed to persist unhindered (i.e., not masticated, not suppressed by herbicides, etc):

- "Many . . . species occur at high burn severity sites starting several years post-fire, . . . and these include the majority of ground and shrub nesters as well as many cavity nesters." (Siegel et al. 2011)[1]

- "[W]hile 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)[2]

- "[T]here 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

[1] Siegel, R.B., M.W. Tingley, and R.L. Wilkerson. 2011. Black-backed Woodpecker MIS surveys on Sierra Nevada national forests: 2010 Annual Report. A report in fulfillment of U.S. Forest Service Agreement No. 08-CS-11052005-201, Modification #2; U.S. Forest Service Pacific Southwest Region, Vallejo, CA.
[2] Burnett, R.D., M. Preston, and N. Seavy. 2012. Plumas Lassen Study 2011 Annual Report. U.S. Forest Service, Pacific Southwest Region, Vallejo, CA.

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)

- In DellaSala et al. 2014,[3] "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.

- In Hanson (2014),[4] "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.

- The best available science strongly demonstrates the association of orange-crowned warblers with post-fire shrub habitat (Siegel et al. 2014 (July 22)[5] [Table 7]), as well as a declining trend (Hanson 2014 [Table 1]).

- Asserting, as the Purpose for the Project does, that iconic native shrub species such as mazanita are merely "brush" that only serve to prevent "tree seedlings from reaching the sun and limited water needed for establishment," and will ultimately create "continuous woody brushfields that impede wildlife movement," is contrary to what we know about healthy, biodiverse forest ecosystems. Forests are more than conifers; native shrubs are critical components of a diverse, post-fire environment. (See, e.g., Nagel and Taylor

---

[3] DellaSala, D.A., M.L. Bond, C.T. Hanson, R.L. Hutto, and D.C. Odion. 2014. Complex early seral forests of the Sierra Nevada: what are they and how can they be managed for ecological integrity? Natural Areas Journal 34: 310-324.
[4] Hanson, C.T. 2014. Conservation concerns for Sierra Nevada birds associated with high-severity fire. Western Birds 45:204–212.
[5] Siegel, R.B., M.W. Tingley, and R.L. Wilkerson. 2014. Black-backed Woodpecker MIS Surveys on Sierra Nevada National Forests: 2013 Annual Report. Report to USFS Pacific Southwest Region. The Institute for Bird Populations, Point Reyes Station, CA.

(2005)[6]). Unfortunately, the Scoping document focuses primarily on the growth of trees at the expense of maintaining an "ecologically healthy and resilient landscape rich in biodiversity." (See Burnett et al. 2010, 2011,[7] 2012; Buchalski et al. 2013[8]; Siegel et al. 2011; Hanson 2014, 2015)

b. **Not only will herbicides destroy shrub habitat (indeed, that is the Project's intended outcome) thus destroying important habitat for many avian species that are in decline (see, e.g., Hanson (2014)), herbicides can be toxic to amphibians, such as the Yosemite toad and the mountain yellow-legged frog (ESA listed species).** For example, Relyea and Jones (2009)[9] examined the toxicity of glyphosate to thirteen species of amphibian larvae. Based on the study and toxicity categories defined by FWS and EPA, Roundup Original Max would be classified as moderately toxic to larval salamanders and moderately toxic to highly toxic to larval anurans. Sparling et al. (2006)[10] showed that glyphosate had several sublethal effects on red-eared slider embryos and hatchlings and that the combination of high concentrations of glyphosate and LI700 can be lethal. In addition, the EPA has determined that glyphosate may affect/is likely to adversely affect the California red-legged frog.[11] This Project, therefore, has the potential to cause significant impacts to ESA listed species. Thus, while at the very least ESA section 7 consultation is required, the prudent action is to forego use of herbicides.

c. **Herbicides are also associated with an increase in the prevalence of flammable grasses (McGinnis et al 2010).[12]** McGinnis et al. 2010 showed that herbicide-treated areas may be in danger of recurrent grass fires because alien grasses and forbs are stimulated to grow when shrubs are killed. In addition, herbicide-treated areas have more alien grass and forb species than areas with high shrub cover. (McGinnis et al 2010).

d. **Natural post-fire regeneration should be allowed to continue unhindered by artificial reforestation**. The following Rim Fire data contradicts the invalid assumptions being made by the Forest Service regarding post-fire natural conifer regeneration. It shows substantial natural post-fire regeneration, as well as substantial

---

[6] Nagel, T.A. and Taylor, A.H. 2005. Fire and persistence of montane chaparral in mixed conifer forest landscapes in the northern Sierra Nevada, Lake Tahoe Basin, California, USA. J. Torrey Bot. Soc.132: 442-457.

[7] Burnett, R.D., P. Taillie, and N. Seavy. 2010. Plumas Lassen Study 2009 Annual Report. U.S. Forest Service, Pacific Southwest Region, Vallejo, CA; Burnett, R.D., P. Taillie, and N. Seavy. 2011. Plumas Lassen Study 2010 Annual Report. U.S. Forest Service, Pacific Southwest Region, Vallejo, CA.

[8] Buchalski, M.R., J.B. Fontaine, P.A. Heady III, J.P. Hayes, and W.F. Frick. 2013. Bat response to differing fire severity in mixed-conifer forest, California, USA. PLOS ONE 8: e57884.

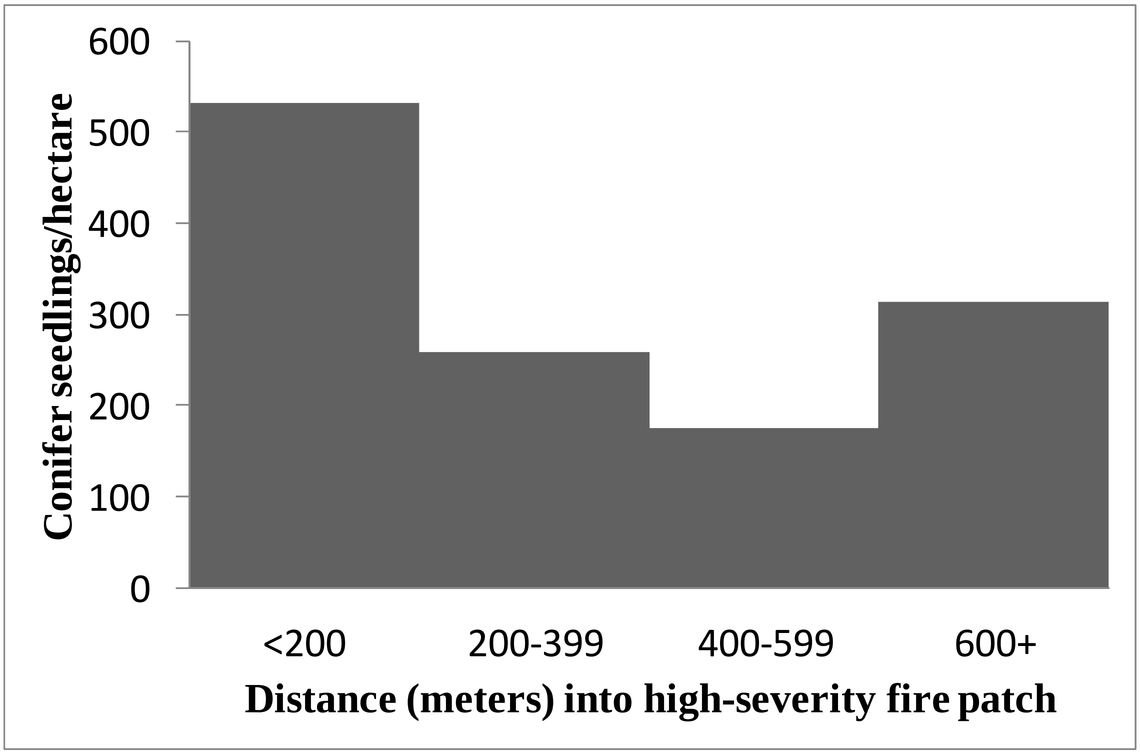
[9] Relyea, Rick A. and Devin K. Jones. 2009. The Toxicity of Roundup Original Max® to Thirteen Species of Larval Amphibians. *Environmental Toxicology and Chemistry* 28(9):2004–2008.

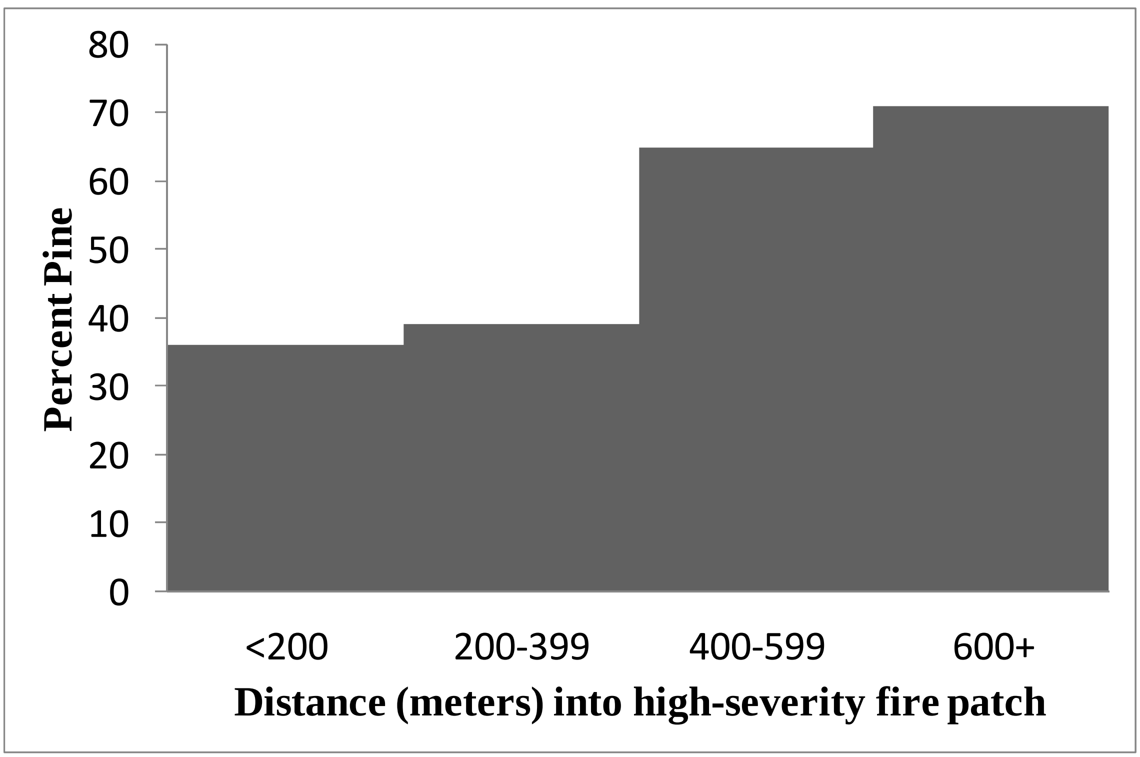
[10] Sparling, Donald W., Cole Matson, John Bickham, and Paige Doelling-Brown. 2006. Toxicity of Glyphosate as Glypro and LI700 to red-eared slider (*Trachemys scripta elegans*) embryos and early hatchlings. *Environmental Toxicology and Chemistry* 25(10):2768–2774.

[11] http://www.epa.gov/espp/litstatus/effects/redleg-frog/glyphosate/determination.pdf

[12] McGinnis, T.W., J. E. Keeley, S. L. Stephens, and Gary B. Roller. 2010. Fuel buildup and potential fire behavior after stand replacing fires, logging fire-killed trees and herbicide shrub removal in Sierra Nevada forests. Forest Ecology and Management 260: 22–35.

heterogeneity resulting from the regeneration, as well as considerable pine regeneration:





Pictures of natural conifer regeneration within the Rim fire:

- A recent study found 715 naturally-regenerating conifer seedlings per hectare in high-severity fire patches in the Storrie fire—a large, intense fire of the northern Sierra Nevada and southern Cascades (Crotteau et al. 2013).[13] An earlier study found that, in eastside mixed-conifer forests dominated by fir species prior to the fire, there were 183 conifers/ha over 2 m tall at 23 years post-fire in an unmanaged high-severity fire patch, and the natural conifer regeneration was 79% "yellow pine complex"—mostly ponderosa pine (*Pinus ponderosa*) and Jeffrey pine (*Pinus jeffreyi*) (Raphael et al. 1987).[14]

- The assumption that higher shrub cover precludes natural conifer regeneration is wrong. For example, Crotteau et al. (2013), Table 4, shows that there were over 700 stems per hectare despite the fact that over 60% of them were overtopped by shrubs. Shatford et al. (2007)[15] also found that shrub cover did not preclude substantial natural conifer regeneration in high-severity fire patches.

- One Forest Service study, Collins and Roller (2013)[16], 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.

- Moreover, post-fire logging kills most of the existing natural conifer regeneration (Donato et al. 2006)[17].

- 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 vegetation removing a native vegetation component necessary to the health and biodiversity of the forest.

e. **California spotted owl and Pacific fisher:** The proposed Project states as a goal: "Restore old forest composition and structure to provide critical habitat for sensitive wildlife species such as the California spotted owl, northern goshawk and fisher." But the California spotted owl and Pacific fisher, in the only published studies addressing these species in post-fire landscapes, have been found to prefer and use the

---

[13] Crotteau JS, Varner JM, Ritchie M. 2013. Post-fire regeneration across a fire severity gradient in the southern Cascades. Forest Ecology and Management 287: 103-112.
[14] Raphael, M.G., M.L. Morrison, and M.P. Yoder-Williams. 1987. Breeding bird populations during twenty-five years of postfire succession in the Sierra Nevada. The Condor 89: 614-626.
[15] Shatford, J.P.A., D.E. Hibbs, and K.J. Puettmann. 2007. Conifer regeneration after forest fire in the Klamath-Siskiyous: how much, how soon? Journal of Forestry April/May 2007, pp. 139-146.
[16] Collins, B.M., and G.B. Roller. 2013. Early forest dynamics in stand-replacing fire patches in the northern Sierra Nevada, California, USA. Landscape Ecology DOI: 10.1007/s10980-013-9923-8.
[17] Donato, D.C., Fontaine, J.B., Campbell, J.L., Robinson, W.D., Kauffman, J.B., Law, B.E., 2006. Post-wildfire logging hinders regeneration and increases fire risk. Science 311: 351.

complex early seral forest that the Project would destroy – in other words, post-fire shrub habitat is itself critical habitat for the owl and fisher.

- The best available science shows that, post-fire, in the Rim fire landscape, there exists substantial California spotted owl occupancy (see Lee and Bond 2015 in press). These owl territories must be left unhindered to allow the owls to use the post-fire habitat that is essential to their survival. As discussed in Bond et al. 2009,[18] California spotted owls preferred to forage in severely burned areas and these "[h]igh-severity sites had the highest herb and shrub cover." Moreover, "[s]potted owl prey species, including dusky-footed woodrats, are more abundant in plant communities with greater understory hardwood, shrub, and herbaceous cover . . . . Understory plants, particularly shrubs and forbs, provide food for woodrats and dense shrubs provide excellent cover. Both of these factors may contribute to greater abundance of this key prey species and stimulate attraction by spotted owls to high-severity burned sites after postfire vegetation regrowth has produced a modest understory. In the northern Sierra Nevada, northern flying squirrels and deer mice are most abundant in areas with open canopy and high shrub cover. Deer mice have also shown strong affinity to forest openings where conifer seeds may become more accessible or stronger competitors may be limited in number. . . . [T]he most likely explanation for the greater probabilities of use by spotted owls of forest patches burned at high severity was increased presence of prey promulgated by enhanced habitat conditions, which we documented as <u>increased shrub and herbaceous cover</u>, and number of snags." (Bond et al. 2009 [emphasis added])

- A recent study on the Mexican Spotted Owl (Ganey et. al., 2014[19]) 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 Rim 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.

- With regard to the Pacific fisher, Hanson (2015) (in press) analyzed additional fisher scat data beyond that assessed in Hanson (2013), and these additional fisher scat-detection surveys were focused mostly in large unlogged higher-intensity fire areas (defined as 50-100% basal area mortality, matching the Forest Service's Region 5 definition of a "deforested condition" under the RAVG remote sensing fire severity program). The current hypothesis that fishers will avoid larger higher-intensity fire patches was rejected and, in fact,

[18] Bond, M. L., D. E. Lee, R. B. Siegel, & J. P. Ward, Jr. 2009. Habitat use and selection by California Spotted Owls in a postfire landscape. Journal of Wildlife Management 73: 1116- 1124.
[19] Ganey, Joseph L. et al. 2014. Relative Abundance of Small Mammals in Nest Core Areas and Burned Wintering Areas of Mexican Spotted Owls in the Sacramento Mountains, New Mexico. The Wilson Journal of Ornithology 126(1): 47–52.

fishers used higher-intensity fire areas at a greater frequency than unburned mature/old forest, though the difference was not statistically significant for fishers overall. Female fishers, in particular, used the large, intense McNally fire more than adjacent unburned mature/old forest, and the difference was statistically significant at the 0.05 significance level (Hanson 2015, in press). Detections of female fisher scat deep into the very largest higher-intensity fire patch (>250 meters inside a ~5,422-hectare higher-intensity fire patch) equated to 0.293/kilometer, while detections/kilometer were 0.192 in adjacent unburned forest (Hanson 2015, in press). These findings indicate that higher-intensity fire in mature conifer forest creates important foraging habitat for Pacific fishers; and removal of such habitat by post-fire logging and shrub eradication and artificial planting could result in significant adverse impacts to fishers (Hanson 2013, Hanson 2015 in press).

- 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)[20]. 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,[21] 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. It is also essential to educate the public about the ecological role of intensely burned forest, including post-fire shrub habitat—the public can best appreciate something when they are well informed about it, and here it is critical to

[20] Donato, D.C., J. L. Campbell, and J. F. Franklin. 2012. Multiple successional pathways and precocity in forest development: can some forests be born complex? Journal of Vegetation Science 23: 576–584.

[21] Swanson, M.E., J.F. Franklin, R.L. Beschta, C.M. Crisafulli, D.A. DellaSala, R.L. Hutto, D. Lindenmayer, and F.J. Swanson. 2011. The forgotten stage of forest succession: early successional ecosystems on forest sites. Frontiers Ecology & Environment 9: 117-125.

educate about wildlife and post-fire shrub habitat in light of past, and current, attacks by the Forest Service on such habitat.

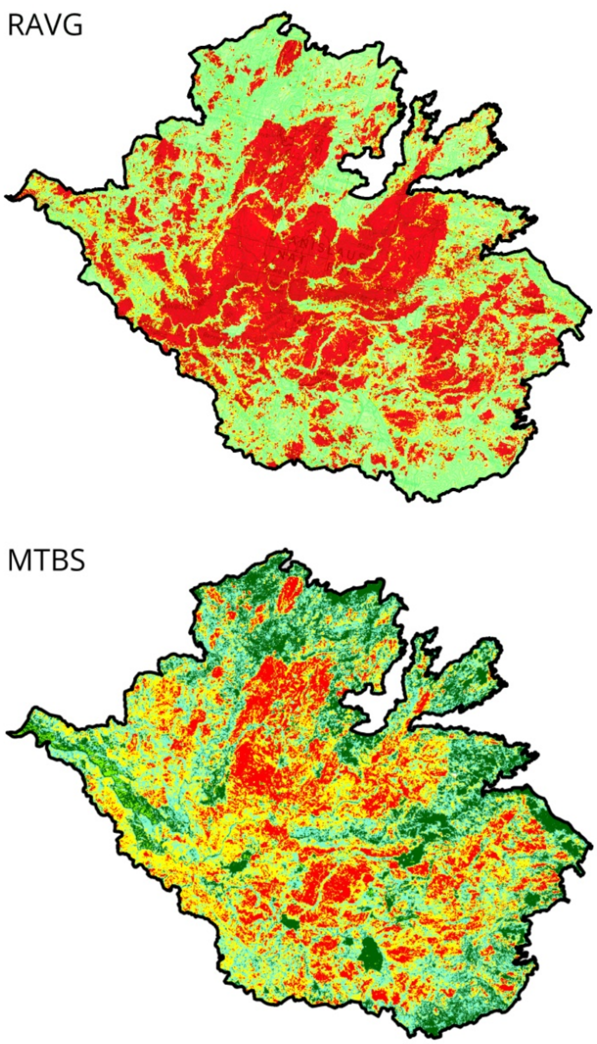
f. **The Scoping Notice and Proposed Action do not describe a Project consistent with ecological resilience**: Ecological resilience pertains to the natural disturbance processes, and the varied habitat types and natural successional stages associated with such natural disturbance, which maintains viable populations of the full range of native biodiversity in the ecosystem, according to the United Nations Convention on Biological Diversity (Thompson et al. 2009).[22] Given the extreme rarity of CESF, 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)[23], 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 post-fire CESF as promoting "resilience" is inaccurate and is highly misleading for the general public.

- The photos below depict the resiliency of high intensity fire patches which were not logged or replanted:

[22] Thompson, I., Mackey, B., McNulty, S., Mosseler, A. 2009. Forest Resilience, Biodiversity, and Climate Change. A synthesis of the biodiversity/resilience/stability relationship in forest ecosystems. Secretariat of the Convention on Biological Diversity, Montreal Technical Series no. 43, 67 pages.

[23] Odion, D.C., and Hanson, C.T. 2013. Projecting impacts of fire management on a biodiversity indicator in the Sierra Nevada and Cascades, USA: the Black-backed Woodpecker. The Open Forest Science Journal 6: 14-23; Baker, W.L. 2014. Historical forest structure and fire in Sierran mixed-conifer forests reconstructed from General Land Office survey data. Ecosphere 5: Article 79; Hanson, C.T., and D.C. Odion. 2014. Is fire severity increasing in the Sierra Nevada, California, USA? International Journal of Wildland Fire 23: 1–8; Odion DC, Hanson CT, Arsenault A, Baker WL, DellaSala DA, et al. (2014) Examining Historical and Current Mixed-Severity Fire Regimes in Ponderosa Pine and Mixed-Conifer Forests of Western North America. PLoS ONE 9(2): e87852.

g. **The RAVG depiction of fire severity is inaccurate.** It is important to recognize that 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 shows:



h. The Empirical Evidence Shows That The Proposed Action Is Not Effective In Reducing Future Fire Intensity

- The Scoping Notice and Proposed Action assume that Project will effectively reduce future fire intensity and severity. 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-Project logged areas, the actual published scientific evidence does not support this modeling assumption (McGinnis et al. 2010; 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.

Sincerely,

Chad Hanson, Ph.D., Director
John Muir Project of Earth Island Institute
P.O. Box 897
Big Bear City, CA 92314
530-273-9290
cthanson1@gmail.com

Justin Augustine
Center for Biological Diversity
351 California St., Suite 600
San Francisco, CA 94104
415-436-9682, ext. 302
jaugustine@biologicaldiversity.org