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Submitted online at https://cara.fs2c.usda.gov/Public/CommentInput?project=60422 and sent via email to: objections-pacificsouthwest-regional-office@usda.gov

Re: Objection on Creek Fire Ecological Restoration Project

Dear Mr. Gould,

On behalf of the John Muir Project of Earth Island Institute (lead Objector) and Center for Biological Diversity, we are submitting this Objection opposing the "Creek Fire Ecological Restoration Project" (Creek Fire Project, or Project).

We request that the Environmental Assessment (EA) be withdrawn, for the reasons articulated below, or that, at a minimum, the Forest Service acknowledge in writing that the EA is a non-comprehensive programmatic plan that will require site-specific Environmental Assessments or Environmental Impact Statements (EISs), with site-specific analysis of the actual environmental conditions and impacts in those areas, and associated decisions, prior to any implementation on any portion of the project area.

In this Objection, we raise the same issues and concerns that we raised in our comments on the Draft EA, except that page numbers have been updated where necessary to reflect re-numbering of pages or Project acreage figures in the Final EA and/or specialist reports, and except for Objection points pertaining to new content in the Final EA that was not in the Draft EA or new information not available at the time of our Draft EA comments.

An EIS Must Be Prepared Due to Potential Significant Effects

NEPA regulations indicate preparation of an EIS is warranted when there are likely to be significant effects to the environment and/or public safety (40 CFR 1501.3(a)), and the potential for commercial "thinning" and post-fire logging to increase, not decrease, fire severity, based on science that we submitted and as recognized by the Ninth Circuit Court of Appeals in the 2020 BARK v. U.S. Forest Service case, which was highly similar to the case here (https://scholar.google.com/scholar_case?case=8163889612711152072&q=BARK+v+forest+service&hl=en&as_sdt=2006).

Below is a summary of numerous scientific sources, in chronological order, in three key subject areas that implicate both the impacted environment as well as public safety. Key findings are quoted and/or summarized, and sources authored or co-authored by U.S. Forest Service scientists are indicated in bold.

A large and growing body of scientific evidence and opinion concludes that commercial thinning and post-fire logging/clearcutting makes wildfires spread faster and/or burn more severely, and this puts nearby communities at greater risk.

Morris, W.G. (**U.S. Forest Service**). 1940. Fire weather on clearcut, partly cut, and virgin timber areas at Westfir, Oregon. Timberman 42: 20-28.

> "This study is concerned with one of these factors - the fire-weather conditions near ground level - on a single operation during the first summer following logging. These conditions were found to be more severe in the clear-cut area than in either the heavy or light partial cutting areas and more severe in the latter areas than in virgin timber."

Countryman, C.M. (**U.S. Forest Service**). 1956. Old-growth conversion also converts fire climate. Fire Control Notes 17: 15-19.

> "Although the general relations between weather factors, fuel moisture, and fire behavior are fairly well known, the importance of these changes following conversion and their combined effect on fire behavior and control is not generally recognized. The term 'fireclimate,' as used here, designates the environmental conditions of weather and fuel moisture that affect fire behavior. It does not consider fuel created by slash because regardless of what forest managers do with slash, they still have to deal with the new fireclimate. In fact, the changes in wind, temperature, humidity, air structure, and fuel moisture may result in greater changes in fire behavior and size of control job than does the addition of more fuel in the form of slash."
>
> "Conversion which opens up the canopy by removal of trees permits freer air movement and more sunlight to reach the ground. The increased solar radiation in turn results in higher temperatures, lower humidity, and lower fuel moisture. The magnitude of these changes can be illustrated by comparing the fireclimate in the open with that in a dense stand."

“A mature, closed stand has a fireclimate strikingly different from that in the open. Here nearly all of the solar radiation is intercepted by the crowns. Some is reflected back to space and the rest is converted to heat and distributed in depth through the crowns. Air within the stand is warmed by contact with the crowns, and the ground fuels are in turn warmed only by contact with the air. The temperature of fuels on the ground thus usually approximates air temperature within the stand.”

“Temperature profiles in a dense, mixed conifer stand illustrate this process (fig. 2). By 8 o'clock in the morning, air within the crowns had warmed to 68° F. Air temperature near the ground was only 50°. By 10 o'clock temperatures within the crowns had reached 82° and, although the heat had penetrated to lower levels, air near the surface at 77° was still cooler than at any other level. At 2:00 p.m., air temperature within the stand had become virtually uniform at 87°. In the open less than one-half mile away, however, the temperature at the surface of pine litter reached 153° at 2:00 p.m.”

“Because of the lower temperature and higher humidity, fuels within the closed stand are more moist than those in the open under ordinary weather conditions. Typically, when moisture content is 3 percent in the open, 8 percent can be expected in the stand.”

“Moisture and temperature differences between open and closed stands have a great effect on both the inception and the behavior of fire. For example, fine fuel at 8-percent moisture content will require nearly one-third more heat for ignition than will the same fuel at 3-percent moisture content. Thus, firebrands that do not contain enough heat to start a fire in a closed stand may readily start one in the open.”

“When a standard fire weather station in the open indicates a temperature of 85° F., fuel moisture of 4 percent, and a wind velocity of 15 m.p.h.--not unusual burning conditions in the West--a fire starting on a moderate slope will spread 4.5 times as fast in the open as in a closed stand. The size of the suppression job, however, increases even more drastically.”

“Greater rate of spread and intensity of burning require control lines farther from the actual fire, increasing the length of fireline. Line width also must be increased to contain the hotter fire. Less production per man and delays in getting additional crews complicate the control problem on a fast-moving fire. It has been estimated that the size of the suppression job increases nearly as the square of the rate of forward spread. Thus, fire in the open will require 20 times more suppression effort. In other words, for each man required to control a surface fire in a mature stand burning under these conditions, 20 men will be required if the area is clear cut.”

“Methods other than clear cutting, of course, may bring a less drastic change in fireclimate. Nevertheless, the change resulting from partial cutting can have important effects on fire. The moderating effect that a dense stand has on the fireclimate usually results in slow-burning fires. Ordinarily, in dense timber only a few days a year have the extreme burning conditions under which surface fires produce heat rapidly enough to

> carry the fire into the crowns. Partial cutting can increase the severity of the fireclimate enough to materially increase the number of days when disastrous crown fires can occur."

SNEP (**co-authored by U.S. Forest Service**). 1996. Sierra Nevada Ecosystem Project, Final Report to Congress: Status of the Sierra Nevada. Vol. I: Assessment summaries and management strategies. Davis, CA: University of California, Davis, Center for Water and Wildland Resources.

> "Timber harvest, through its effects on forest structure, local microclimate, and fuel accumulation, has increased fire severity more than any other recent human activity."

> "[I]n areas where the larger trees (greater than 12 inches in diameter breast height) have been removed, stand-replacing fires are more likely to occur."

Beschta, R.L.; Frissell, C.A.; Gresswell, R.; Hauer, R.; Karr, J.R.; Minshall, G.W.; Perry, D.A.; Rhodes, J.J. 1995. Wildfire and salvage logging. Eugene, OR: Pacific Rivers Council.

> "We also need to accept that in many drier forest types throughout the region, forest management may have set the stage for fires larger and more intense than have occurred in at least the last few hundred years."

> "With respect to the need for management treatments after fires, there is generally no need for urgency, nor is there a universal, ecologically-based need to act at all. By acting quickly, we run the risk of creating new problems before we solve the old ones."

> "[S]ome argue that salvage logging is needed because of the perceived increased likelihood that an area may reburn. It is the fine fuels that carry fire, not the large dead woody material. We are aware of no evidence supporting the contention that leaving large dead woody material significantly increases the probability of reburn."

Chen, J., et al. (**co-authored by U.S. Forest Service**). 1999. Microclimate in forest ecosystem and landscape ecology: Variations in local climate can be used to monitor and compare the effects of different management regimes. BioScience 49: 288–297.

> When moving from open forest areas, resulting from logging, and into dense forests with high canopy cover, "there is generally a decrease in daytime summer temperatures but an increase in humidity…"

> The authors reported a 5° C difference in ambient air temperature between a closed-canopy mature forest and a forest with partial cutting, like a commercial thinning unit (Fig. 4b), and noted that such differences are even greater than the increases in temperature predicted due to anthropogenic climate change.

Dombeck, M. (**U.S. Forest Service Chief**). 2001. How Can We Reduce the Fire Danger in the Interior West. Fire Management Today 61: 5-13.

> "Some argue that more commercial timber harvest is needed to remove small-diameter trees and brush that are fueling our worst wildlands fires in the interior West. However, small-diameter trees and brush typically have little or no commercial value. To offset losses from their removal, a commercial operator would have to remove large, merchantable trees in the overstory. Overstory removal lets more light reach the forest floor, promoting vigorous forest regeneration. Where the overstory has been entirely removed, regeneration produces thickets of 2,000 to 10,000 small trees per acre, precisely the small-diameter materials that are causing our worst fire problems. In fact, many large fires in 2000 burned in previously logged areas laced with roads. It seems unlikely that commercial timber harvest can solve our forest health problems."

Morrison, P.H. and K.J. Harma. 2002. Analysis of Land Ownership and Prior Land Management Activities Within the Rodeo & Chediski Fires, Arizona. Pacific Biodiversity Institute, Winthrop, WA. 13 pp.

> Previous logging was associated with higher fire severity.

Donato DC, Fontaine JB, Campbell JL, Robinson WD, Kauffman JB, Law BE. 2006. *Science* 311: 352.

> "In terms of short-term fire risk, a reburn in [postfire] logged stands would likely exhibit elevated rates of fire spread, fireline intensity, and soil heating impacts…Postfire logging alone was notably incongruent with fuel reduction goals."

Hanson, C.T., Odion, D.C. 2006. Fire Severity in mechanically thinned versus unthinned forests of the Sierra Nevada, California. In: Proceedings of the 3rd International Fire Ecology and Management Congress, November 13-17, 2006, San Diego, CA.

> "In all seven sites, combined mortality [thinning and fire] was higher in thinned than in unthinned units. In six of seven sites, fire-induced mortality was higher in thinned than in unthinned units…Mechanical thinning increased fire severity on the sites currently available for study on national forests of the Sierra Nevada."

Platt, R.V., et al. 2006. Are wildfire mitigation and restoration of historic forest structure compatible? A spatial modeling assessment. Annals of the Assoc. Amer. Geographers 96: 455-470.

> "Compared with the original conditions, a closed canopy would result in a 10 percent reduction in the area of high or extreme fireline intensity. In contrast, an open canopy

[from thinning] has the opposite effect, increasing the area exposed to high or extreme fireline intensity by 36 percent. Though it may appear counterintuitive, when all else is equal open canopies lead to reduced fuel moisture and increased midflame windspeed, which increase potential fireline intensity."

Thompson, J.R., Spies, T.A., Ganio, L.M. (**co-authored by U.S. Forest Service**). 2007. Reburn severity in managed and unmanaged vegetation in a large wildfire. Proceedings of the National Academy of Sciences of the United States of America 104: 10743–10748.

"Areas that were salvage-logged and planted after the initial fire burned more severely than comparable unmanaged areas."

Cruz, M.G, and M.E. Alexander. 2010. Assessing crown fire potential in coniferous forests of western North America: A critique of current approaches and recent simulation studies. Int. J. Wildl. Fire. 19: 377–398.

The fire models used by the U.S. Forest Service falsely predict effective reduction in crown fire potential from thinning:

"Simulation studies that use certain fire modelling systems (i.e. NEXUS, FlamMap, FARSITE, FFE-FVS (Fire and Fuels Extension to the Forest Vegetation Simulator), Fuel Management Analyst (FMAPlus), BehavePlus) based on separate implementations or direct integration of Rothermel's surface and crown rate of fire spread models with Van Wagner's crown fire transition and propagation models are shown to have a significant underprediction bias when used in assessing potential crown fire behaviour in conifer forests of western North America. The principal sources of this underprediction bias are shown to include: (i) incompatible model linkages; (ii) use of surface and crown fire rate of spread models that have an inherent underprediction bias; and (iii) reduction in crown fire rate of spread based on the use of unsubstantiated crown fraction burned functions. The use of uncalibrated custom fuel models to represent surface fuelbeds is a fourth potential source of bias."

Thompson, J., and T.A. Spies (**co-authored by U.S. Forest Service**). 2010. Exploring Patterns of Burn Severity in the Biscuit Fire in Southwestern Oregon. Fire Science Brief 88: 1-6.

"Areas that burned with high severity…in a previous wildfire (in 1987, 15 years prior) were more likely to burn with high severity again in the 2002 Biscuit Fire. Areas that were salvage-logged and planted following the 1987 fire burned with somewhat higher fire severity than equivalent areas that had not been logged and planted."

Graham, R., et al. (**U.S. Forest Service**). 2012. Fourmile Canyon Fire Findings. Gen. Tech. Rep. RMRS-GTR-289. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 110 p.

> Thinned forests "were burned more severely than neighboring areas where the fuels were not treated", and 162 homes were destroyed by the Fourmile Canyon Fire (see Figs. 45 and 46).

DellaSala et al. (2013) (letter from over 200 scientists):

> "Numerous studies also document the cumulative impacts of post-fire logging on natural ecosystems, including…accumulation of logging slash that can add to future fire risks…"

DellaSala et al. (2015) (letter from over 200 scientists):

> "Post-fire logging has been shown to eliminate habitat for many bird species that depend on snags, compact soils, remove biological legacies (snags and downed logs) that are essential in supporting new forest growth, and spread invasive species that outcompete native vegetation and, in some cases, increase the flammability of the new forest. While it is often claimed that such logging is needed to restore conifer growth and lower fuel hazards after a fire, many studies have shown that logging tractors often kill most conifer seedlings and other important re-establishing vegetation and actually increases flammable logging slash left on site. Increased chronic sedimentation to streams due to the extensive road network and runoff from logging on steep slopes degrades aquatic organisms and water quality."

Bradley, C.M. C.T. Hanson, and D.A. DellaSala. 2016. Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western USA? Ecosphere 7: article e01492.

> In the largest study on this subject ever conducted in western North American, the authors found that the more trees that are removed from forests through logging, the higher the fire severity overall:
>
> "We investigated the relationship between protected status and fire severity using the Random Forests algorithm applied to 1500 fires affecting 9.5 million hectares between 1984 and 2014 in pine (*Pinus ponderosa*, *Pinus jeffreyi*) and mixed-conifer forests of western United States, accounting for key topographic and climate variables. We found forests with higher levels of protection [from logging] had lower severity values even though they are generally identified as having the highest overall levels of biomass and fuel loading."

Lesmeister, D.B., et al. (**co-authored by U.S. Forest Service**). 2019. Mixed-severity wildfire and habitat of an old-forest obligate. Ecosphere10: Article e02696.

Denser, older forests with high canopy cover had lower fire severity.

Dunn, C.J., et al. 2020. How does tree regeneration respond to mixed-severity fire in the western Oregon Cascades, USA? Ecosphere 11: Article e03003.

Forests that burned at high-severity had lower, not higher, overall pre-fire tree densities.

Meigs, G.W., et al. (**co-authored by U.S. Forest Service**). 2020. Influence of topography and fuels on fire refugia probability under varying fire weather in forests of the US Pacific Northwest. Canadian Journal of Forest Research 50: 636-647.

Forests with higher pre-fire biomass are more likely to experience low-severity fire.

Moomaw et al. (2020) (letter from over 200 scientists):

> "Troublingly, to make thinning operations economically attractive to logging companies, commercial logging of larger, more fire-resistant trees often occurs across large areas. Importantly, mechanical thinning results in a substantial net loss of forest carbon storage, and a net increase in carbon emissions that can substantially exceed those of wildfire emissions (Hudiburg et al. 2013, Campbell et al. 2012). Reduced forest protections and increased logging tend to make wildland fires burn *more* intensely (Bradley et al. 2016). This can also occur with commercial thinning, where mature trees are removed (Cruz et al. 2008, Cruz et al. 2014). As an example, logging in U.S. forests emits 10 times more carbon than fire and native insects combined (Harris et al. 2016). And, unlike logging, fire cycles nutrients and helps increase new forest growth."

Moomaw et al. (2021) (letter from over 200 scientists):

> "[C]ommercial logging conducted under the guise of "thinning" and "fuel reduction" typically removes mature, fire-resistant trees that are needed for forest resilience. We have watched as one large wildfire after another has swept through tens of thousands of acres where commercial thinning had previously occurred due to extreme fire weather driven by climate change. Removing trees can alter a forest's microclimate, and can often increase fire intensity. In contrast, forests protected from logging, and those with high carbon biomass and carbon storage, more often burn at equal or lower intensities when fires do occur."

Lesmeister, D.B., et al. (**co-authored by U.S. Forest Service**). 2021. Northern spotted owl nesting forests as fire refugia: a 30-year synthesis of large wildfires. Fire Ecology 17: Article 32.

> More open forests with lower biomass had higher fire severity, because the type of open, lower-biomass forests resulting from thinning and other logging activities have "hotter, drier, and windier microclimates, and those conditions decrease dramatically over relatively short distances into the interior of older forests with multi-layer canopies and high tree density…"

Stephens, S.L., et al. (**co-authored by U.S. Forest Service**). 2021. Forest Restoration and Fuels Reduction: Convergent or Divergent? BioScience 71: 85-101.

> While the authors continued to promote commercial thinning, they acknowledged that commercial thinning causes wildfires to move faster and become larger more quickly:
>
> "Interestingly, surface fire rate of spread increased after restoration and fuel treatments [commercial thinning] relative to the untreated stand. This increased fire rate of spread following both treatment types is due to a combination of higher mid-flame wind speeds and a greater proportion of grass fuels, which result from reductions to canopy cover."

Hanson, C.T. 2021. Is "Fuel Reduction" Justified as Fire Management in Spotted Owl Habitat? Birds 2: 395-403.

> "Within the forest types inhabited by California Spotted Owls, high-severity fire occurrence was not higher overall in unmanaged forests and was not associated with the density of pre-fire snags from recent drought in the Creek Fire, contrary to expectations under the fuel reduction hypothesis. Moreover, fuel-reduction logging in California Spotted Owl habitats was associated with higher fire severity in most cases. The highest levels of high-severity fire were in the categories with commercial logging (post-fire logging, private commercial timberlands, and commercial thinning), while the three categories with lower levels of high-severity fire were in forests with no recent forest management or wildfire, less intensive noncommercial management, and unmanaged forests with re-burning of mixed-severity wildfire, respectively."

Hanson, C.T. 2022. Cumulative severity of thinned and unthinned forests in a large California wildfire. Land 11: Article 373.

> "Using published data regarding the percent basal area mortality for each commercial thinning unit that burned in the Antelope fire, combined with percent basal area mortality due to the fire itself from post-fire satellite imagery, it was found that commercial thinning was associated with significantly higher overall tree mortality levels (cumulative severity)."

Baker, B.C., and C.T. Hanson. 2022. Cumulative tree mortality from commercial thinning and a large wildfire in the Sierra Nevada, California. Land 11: Article 995.

> "Similar to the findings of Hanson (2022) in the Antelope Fire of 2021 in northern California, in our investigation of the Caldor Fire of 2021 we found significantly higher cumulative severity in forests with commercial thinning than in unthinned forests, indicating that commercial thinning killed significantly more trees than it prevented from being killed in the Caldor Fire…Despite controversy regarding thinning, there is a body of scientific literature that suggests commercial thinning should be scaled up across western US forest landscapes as a wildfire management strategy. This raises an important question: what accounts for the discrepancy on this issue in the scientific literature? We believe several factors are likely to largely explain this discrepancy. First and foremost, because most previous research has not accounted for tree mortality from thinning itself, prior to the wildfire-related mortality, such research has underreported tree mortality in commercial thinning areas relative to unthinned forests. Second, some prior studies have not controlled for vegetation type, which can lead to a mismatch when comparing severity in thinned areas to the rest of the fire area given that thinning necessarily occurs in conifer forests but unthinned areas can include large expanses of non-conifer vegetation types that burn almost exclusively at high severity, such as grasslands and chaparral. Third, some research reporting effectiveness of commercial thinning in terms of reducing fire severity has been based on the subjective location of comparison sample points between thinned and adjacent unthinned forests. Fourth, reported results have often been based on theoretical models, which subsequent research has found to overestimate the effectiveness of thinning. Last, several case studies draw conclusions about the effectiveness of thinning as a wildfire management strategy when the results of those studies do not support such a conclusion, as reviewed in DellaSala et al. (2022)." (internal citations omitted)

Prichard, S.J., et al. (**co-authored by U.S. Forest Service**). 2021. Adapting western US forests to wild-fires and climate change: 10 key questions. Ecological Applications 31: Article e02433.

> In a study primarily authored by U.S. Forest Service scientists, and scientists funded by the Forest Service, the authors state that "There is little doubt that fuel reduction treatments can be effective at reducing fire severity..." yet these authors repeatedly contradict their own proposition, acknowledging that thinning can cause "higher surface fuel loads," which "can contribute to high-intensity surface fires and elevated levels of associated tree mortality," and mastication of such surface fuels "can cause deep soil heating" and "elevated fire intensities." The authors also acknowledge that thinning "can lead to increased surface wind speed and fuel heating, which allows for increased rates of fire spread in thinned forests," and even the combination of thinning and prescribed fire "may increase the risk of fire by increasing sunlight exposure to the forest floor, drying vegetation, promoting understory growth, and increasing wind speeds."

Despite these admissions, contradicting their promotion of thinning, the authors cite to several U.S. Forest Service-funded studies for the proposition that thinning can effectively reduce fire severity, but a subsequent analysis of those same studies found that the results of these articles do not support that conclusion, and often contradict it, as detailed in Section 5.2 of DellaSala et al. (2022) (see below).

DellaSala, D.A., B.C. Baker, C.T. Hanson, L. Ruediger, and W.L. Baker. 2022. Have western USA fire suppression and megafire active management approaches become a contemporary Sisyphus? Biological Conservation 268: Article 109499.

With regard to a previous U.S. Forest Service study claiming that commercial thinning effectively reduced fire severity in the large Wallow fire of 2011 in Arizona, DellaSala et al. (2022, Section 5.1) conducted a detailed accuracy check and found that the previous analysis had dramatically underreported high-severity fire in commercial thinning units, and forests with commercial thinning in fact had higher fire severity, overall.

DellaSala et al. (2022, Section 5.2) also reviewed several U.S. Forest Service studies relied upon by Prichard et al. (2021) for the claim that commercial thinning is an effective fire management approach and found that the actual results of these cited studies did not support that conclusion.

Bartowitz, K.J., et al. 2022. Forest Carbon Emission Sources Are Not Equal: Putting Fire, Harvest, and Fossil Fuel Emissions in Context. Front. For. Glob. Change 5: Article 867112.

The authors found that logging conducted as commercial thinning, which involves removal of some mature trees, substantially increases carbon emissions relative to wildfire alone, and commercial thinning "causes a higher rate of tree mortality than wildfire."

Evers, C., et al. 2022. Extreme Winds Alter Influence of Fuels and Topography on Megafire Burn Severity in Seasonal Temperate Rainforests under Record Fuel Aridity. Fire 5: Article 41.

The authors found that dense, mature/old forests with high biomass and canopy cover tended to have lower fire severity, while more open forests with lower canopy cover and less biomass burned more severely.

USFS (U.S. Forest Service) (2022). Gallinas-Las Dispensas Prescribed Fire Declared Wildfire Review. U.S. Forest Service, Office of the Chief, Washington, D.C.

"A thinning project in the burn area opened the canopy in some areas, allowing more sunlight which led to lower fuel moistures. Heavy ground fuels resulting from the

> construction of fireline for the burn project added to the fuel loading. This contributed to higher fire intensities, torching, spotting, and higher resistance-to-control."

The only effective way to protect homes from fire is home-hardening and defensible space pruning within 100 to 200 feet of homes or less.

Cohen, J.D. (**U.S. Forest Service**). 2000. Preventing disaster: home ignitability in the wildland-urban interface. Journal of Forestry 98: 15-21.

> The only relevant zone to protect homes from wildland fire is within approximately 135 feet or less from each home—not out in wildland forests.

Gibbons P, van Bommel L, Gill MA, Cary GJ, Driscoll DA, Bradstock RA, Knight E, Moritz MA, Stephens SL, Lindenmayer DB (2012) Land management practices associated with house loss in wildfires. PLoS ONE **7**: Article e29212.

> Defensible space pruning within less than 130 feet from homes was effective at protecting homes from wildfires, while vegetation management in remote wildlands was not. A modest additional benefit for home safety was provided by prescribed burning less than 500 meters (less than 1641 feet) from homes.

Syphard, A.D., T.J. Brennan, and J.E. Keeley. 2014. The role of defensible space for residential structure protection during wildfires. Intl. J. Wildland Fire 23: 1165-1175.

> Vegetation management and removal beyond approximately 100 feet from homes provides no additional benefit in terms of protecting homes from wildfires.

Tree removal is not necessary prior to conducting prescribed fire as an additional community safety buffer.

Decades of scientific studies have proven that, even in the densest forests that have not experienced fire in many decades, prescribed fire can be applied without prior tree removal, as demonstrated in the following studies:

Knapp EE, Keeley JE, Ballenger EA, Brennan TJ. 2005. Fuel reduction and coarse woody debris dynamics with early season and late season prescribed fire in a Sierra Nevada mixed conifer forest. Forest Ecology and Management 208: 383–397.

Knapp, E.E., and Keeley, J.E. 2006. Heterogeneity in fire severity within early season and late season prescribed burns in a mixed-conifer forest. Int. J. Wildland Fire 15: 37–45.

Knapp, E.E., Schwilk, D.W., Kane, J.M., Keeley, J.E., 2007. Role of burning on initial understory vegetation response to prescribed fire in a mixed conifer forest. Canadian Journal of Forest Research 37: 11–22.

van Mantgem, P.J., A.C. Caprio, N.L. Stephenson, and A.J. Das. 2016. Does prescribed fire promote resistance to drought in low elevation forests of the Sierra Nevada, California, USA? Fire Ecology 12: 13-25.

van Mantgem, P.J., N.L. Stephenson, J.J. Battles, E.K. Knapp, and J.E. Keeley. 2011. Long-term effects of prescribed fire on mixed conifer forest structure in the Sierra Nevada, California. Forest Ecology and Management 261: 989−994.

Critical Habitat Must Be Designated for the Pacific Fisher

The U.S. Fish and Wildlife Service has not yet finalized its proposal to designate critical habitat for the southern Sierra Nevada Pacific fisher under the Endangered Species Act (ESA). Logging should not occur until critical fisher habitat is finalized and impacts to both the fisher and its critical habitat analyzed and consulted on under the ESA.

An EIS Must Be Prepared Due to Impacts to the Pacific Fisher and Spotted Owl, and the "May Affect, Not Likely to Adversely Affect" Conclusion is Arbitrary and Capricious

NEPA regulations indicate that the preparation of an environmental impact statement (EIS) is likely necessary when a project may impact a species listed under the ESA. 40 CFR 1501.3(b)(1). The southern Sierra Nevada Pacific fisher is listed under the ESA as endangered and inhabits the proposed project area; thus, an EIS, not an EA, should be prepared here in light of the size and magnitude of the proposed Project. The EA (p. 57) asserts that the Project "may affect" the fisher but is "not likely to adversely affect" the fisher. This is arbitrary and capricious. Nowhere does the EA divulge the amount of "take" of fishers that would result from the Project, which proposes over 130,000 acres of logging, including clearcutting, in Pacific fisher habitat, and the Project documents do not include any Biological Opinion (BO) from US Fish and Wildlife Service. The EA states, pp. 9-10, for example, that the actual adverse impacts on Pacific fishers of 68,000 acres of proposed post-fire logging and tree plantations (characterized on p. 9 of the EA as "site preparation" ostensibly to reduce "hazardous fuels") will be assessed as implementation occurs. Specifically, the EA states (p. 10) the following:

> For example, where feasible, reforestation and planting activities would be prioritized in key fisher connection corridors where vegetative cover was lost, to facilitate fisher movement in the long term. Because these wildlife habitat treatments are integrated with other activities or would occur in very localized areas that ***have yet to be determined***, they are not reflected separately on the maps.
>
> (emphasis added)

On p. 11, the EA states that 53,000 acres of management would occur in low-severity fire areas and unburned forests, but states that it might be either commercial thinning plus prescribed fire or low-intensity prescribed fire alone—without divulging how much of the 53,000 acres would be comprised of logging or where such logging would be located (e.g., occupied fisher habitat, including potentially in critical habitat). On p. 12, the EA further admits the following:

> ***We do not currently have detailed site surveys to use for determining specific prescriptions***. This level of information was not available during the planning process due to the limitations of size and scale, safe access to the post-fire area, funding, and capacity to conduct surveys across such a large area.
>
> For most activities, prior to implementation we would verify conditions through on-the-ground field review or survey and ***then develop specific units and detailed prescriptions within the broader treatment areas***.
>
> (emphasis added)

This is a violation of both NEPA (failure to take a hard look at impacts, and failure to prepare an EIS) and the ESA (consultation must occur well before, not during, implementation).

Moreover, the EA (p. 57) bases its assumption about no-adverse-impacts on general avoidance of fisher den sites; but fishers depend on much more than 700-acre den sites for their survival. Fisher home ranges cover several thousand acres, not several hundred (Zielinski et al. 2004), and they are adversely impacted by management activities that affect or degrade their foraging habitat (Garner 2013, Hanson 2013, Hanson 2015)—the areas they use for hunting to obtain the food they need for survival. Therefore, the question is, where do fishers forage and would the Project affect such areas?

Dr. Hanson has published multiple peer-reviewed studies regarding SSN fishers and wildland fire. In 2012, he began extensive field research with two “scat dog” teams on the Kern Plateau of Sequoia National Forest to investigate the relationship between Pacific fishers, forest structure, and wildland fire. Each scat dog team consists of a rescue dog that has been highly trained to detect the scat (excrement) of a particular imperiled wildlife species, and the dog’s human handler. In this case, the dogs had been trained to detect Pacific fisher scat. Dr. Hanson used this approach to determine the frequency/infrequency of fisher scat along transects (routes traveled through the forest by the teams) in different habitat conditions, which yielded the basis to determine fisher habitat selection or avoidance patterns. Dr. Hanson found that Pacific fishers were positively associated with dense, mature forests (particularly mixed-conifer forests) that were unburned and dense, mature forests that had experienced mixed-intensity wildfires, while they avoided lower-density forests with less biomass of live and dead trees (Hanson 2013). On the edges of fire areas, fishers selected the within-fire side over the unburned side of fire edges and, when entirely inside fire areas, fishers selected forests with larger proportions of high-intensity fire (high-intensity fire areas are patches where the fire killed most or all of the trees). The fire areas studied had not been subjected to post-fire logging.

Dr. Hanson conducted a follow up fisher scat dog study in 2013, gathering additional data within the McNally fire, which burned across more than 150,000 acres in 2002 in the Kern Plateau area, and once again focusing surveys in areas that had not been subjected to post-fire logging. Dr. Hanson found that female fishers, in particular, positively selected the McNally fire over adjacent unburned forest (Hanson 2015). In fact, female fisher scat frequency was 0.29 per kilometer in areas that were more than 250 meters inside the interior of the largest high-intensity fire patch in the McNally fire, compared to 0.19 per kilometer in adjacent unburned forest (Hanson 2015). Moreover, Dr. Hanson found numerous male and female fisher scats deep within (several kilometers or more) the interior of the McNally fire, indicating that these fishers were denning and foraging entirely within the fire area, based upon the home range size of fishers (Zielinski et al. 2004).

The conclusion that Dr. Hanson drew from this fisher research is that fishers benefit from the "bed and breakfast effect" created by mixed-intensity fire. They use dense, mature/old conifer forests that are either unburned or more lightly burned for denning and resting (the "bed"), while they actively forage and hunt in the "snag forest habitat" (the "breakfast") created when higher-intensity fire occurs in dense, mature/old forest (Hanson 2013, 2015). These snag forest habitat areas, which this research concludes are suitable foraging habitat for the SSN fisher, are characterized by an abundance of fire-killed trees ("snags"), downed logs (when snags fall), patches of native shrubs, and areas of natural post-fire regeneration of conifer seedlings/saplings and oaks. The high abundance of snags, downed logs, and lush post-fire understory regrowth provides outstanding habitat for small mammal species upon which fishers depend for their food, and small mammal abundance can be 2 to 6 times higher in snag forest habitat compared to unburned mature forest (Ganey et al. 2014). The natural and historical fire regime in forests inhabited by Pacific fishers is mixed-intensity fire, where small and large patches of high-intensity fire occur at significant proportions (typically 22% to 39%) within a mosaic of low- and moderate-intensity fire effects, where most mature trees and many small trees survive the fire (Baker 2014, Hanson and Odion 2016a, Hanson and Odion 2016b, Baker and Hanson 2017, Baker et al. 2018).

Dr. Hanson also concluded from this research that, by removing much of the forest canopy cover and many/most of the trees, commercial "thinning" logging operations degrade and harm the dense, mature/old forests upon which fishers depend for denning/resting, while post-fire logging operations degrade and harm the snag forest habitat which fishers actively use for foraging, because such post-fire logging removes most of the snags, downed logs, and native post-fire understory regrowth that the fisher's small mammal prey species need for their habitat (Hanson 2013, 2015). In other words, the U.S. Forest Service's duel program of targeting dense, mature/old forests with commercial thinning, while targeting snag forest habitat with post-fire logging, is a "double-whammy" adverse impact to Pacific fishers. These scientific findings have been acknowledged by the U.S. Fish and Wildlife Service in its decision to list the SSN fisher as endangered. *See* 85 Fed. Reg. 29540, 29564.

Two Creek fire project reports, Wuenschel et al. (2021) and the Wildlife report, reference Thompson et al. (2021) regarding Pacific fisher use of recent post-fire habitat in the Aspen and French fires, which later re-burned in the Creek fire. However, the Thompson et al. (2021) study fails to mention that many of the moderate/high-severity fire areas studied in the Aspen and

French fires had been post-fire logged, which is a significant problem given the findings of Green et al. (2022) ("The probability that salvage logging had negative effects on fisher and gray fox density was 97% and 100%, respectively"). Moreover, Thompson et al. (2021) falsely claimed in the discussion section that the fisher detections in Dr. Hanson's studies were not actually in high-severity fire patches, but provided no data to support this statement. Attached, as **Appendix A**, is satellite imagery showing the locations of multiple fisher detections hundreds of meters inside a large high-severity fire patch (unlogged) in the McNally fire area. An on-the-ground photo of one of these locations is found, in color, in Hanson (2015). By relying upon misleading information in the Thompson et al. (2021) study, the Creek fire Draft EA arbitrarily downplays the adverse impacts of post-fire logging.

The Wildlife report, on pp. 12-14, arbitrarily minimizes and downplays the impacts and cumulative effects from the proposed landscape-scale post-fire clearcutting of 68,000 acres of snag forest habitat that fishers actively use for foraging (Hanson 2013, Hanson 2015), and 53,000 acres of commercial thinning, by claiming that the logging will effectively prevent future high-severity fire and that this will somehow benefit fishers. But the Wildlife report, the Wuenschel report, and the EA ignore and omit mention of the Hanson (2013, 2015) research, and also omit mention of the vast body of science finding that such logging does not effectively curb fire severity and will often increase it (see above).

On p. 151, the EA identifies some limitations on logging in areas of fisher habitat, but does not disclose how such areas are defined or disclose their locations. The EA, on p. 28, also fails to divulge what the Forest Service's "desired" forest density is, and states that the Forest Service does not know whether post-fire stands in the 54,000 acres described below have forest densities exceeding the agency's "desired conditions":

> Conversely, within the approximately 54,000 acres of Sierra mixed conifer, red fir, and ponderosa forest types in the project area that were unburned or experienced low severity fire, there are approximately 21,000 acres that had high stand densities and canopy covers greater than desired conditions prior to the Creek Fire. Stand densities are potentially still greater than desired conditions. Overly dense stands contribute to stressed trees, resulting in drought, or insect, and disease-caused mortality. Additionally, this leads to excessive fuel loading, resulting in an increased risk of high severity fire in the future.

In fact, nowhere does the EA provide any data on post-fire forest density in these low-severity burned forests, or explain the rationale or basis for further reducing tree density. The EA proposes up to 53,000 acres of commercial thinning, ostensibly to reduce forest density in stands that exceed "desired" forest density. However, the passage above makes clear that only 21,000 acres of forest exceeded the Forest Service's "desired" forest density *before* the Creek fire occurred. Even though the forest density in these 21,000 acres would be even lower now, after the Creek fire, the EA does not disclose what that current, post-fire density is in these 21,000 acres, relative to the agency's "desired" range of forest density, whatever that might be. There is no rational connection between the facts and the proposed decision to commercially thin 53,000 acres of forest supposedly to reduce forest density in excess of "desired" conditions. Moreover, p. 26 of the EA misstate fire effects in the Creek fire, claiming that 19% of the forests inside the fire perimeter are "unburned", and proposing widespread commercial thinning in such areas on that basis. But this figure is incorrect—the MTBS fire severity map **(see attached)**, based on one-year post-fire data from USGS, the Forest Service, and other agencies, describes only 10% of the fire as "very low" severity or "unburned"—it does not explain what percentage of this 10% category is "unburned" versus "very low severity", but it is clear that even this 10% is not simply "unburned".

The EA suggests that the low-severity burned forests that the Forest Service proposes to commercially thin (the 53,000 acres) are unnaturally dense in terms of live trees per acre, but the EA provides no basis to support this suggestion. Based on historical forest survey data, historical forests had 172 trees per acre on average in ponderosa pine forests and 213 trees per acre on average in mixed-conifer forests, with many stands having far higher densities than this historically, and this finding is undisputed in the scientific literature (Baker et al. 2018).

The EA (p. 28) also claims, without citation to any scientific source, that, historically, high-severity fire patches would have been no larger than 120 acres, and that there is an 80,000 acre high-severity fire patch in the Creek fire. Neither of these things is true. There is abundant evidence that high-severity fire patches thousands of acres, and even tens of thousands of acres, in size occurred prior to fire suppression and logging (Hanson 2007, Odion et al. 2014, Baker and Hanson 2017, DellaSala and Hanson 2019). Further, there is no high-severity fire patch 80,000 acres in size in the Creek fire. The Forest Service's own MTBS fire severity mapping, from one year post-fire, shows some high-severity fire patches several thousand acres in size but the total acreage of high-severity fire, in all patches of all sizes combined across the entire fire area, is less than 61,000 acres.

The Draft Decision Notice "authorize[s] the near-term treatment areas described in tables 1 and 2 of the Proposed Action section of the Creek Fire Ecological Restoration Project Environmental Assessment." This too is arbitrary and capricious because it has not been demonstrated that the logging in these treatment areas is not likely to adversely affect fishers. For example, the near-term treatments include 8,000 acres of "resilience" logging in critical habitat and 6,000 acres of reforestation logging in high/moderate denning habitat and critical habitat (see Table 6 from the BA). Because this logging can degrade denning, nesting, and foraging habitat, it is likely to adversely affect fishers.

The authorization is also arbitrary and capricious with respect to the California spotted owl because there is no analysis of post-logging habitat showing that sufficient owl habitat will be available to support owls. This failure to protect nesting, roosting, and foraging habitat is likely to contribute to further CSO decline and therefore preclude its viability.

An EIS Must Be Prepared Due to the Enormous Scope, Intensity, and Magnitude of the Project

As far as we can tell, this is the largest logging project ever proposed in the history of the Sierra National Forest. In fact, it appears to be the largest logging project ever proposed in the history of all Sierra Nevada national forests. The Project would have landscape-scale impacts to endangered Pacific fishers, imperiled Spotted Owls (Sensitive Species), and rare Black-backed

Woodpeckers, among many other species. This huge commercial logging project would involve 53,000 acres of commercial "thinning" of mature/old trees up to 30 inches in diameter (such trees are generally 100 to 200 years old, Hanson and Odion 2016a), and approximately 84,000 acres of post-fire logging (68,000 acres + 6950 acres + 8900 acres, see pp. 8-9 of the EA), and an additional undisclosed number of acres of roadside hazard tree post-fire logging along 235 miles of roads (EA, p. 8), which combined would likely total over 100,000 acres. The fact that the Forest Service claims it will be beneficial (the Forest Service makes this claim about all proposed commercial logging projects) is immaterial. NEPA regulations makes clear that agency claims of beneficial effects do not affect the obligation to prepare an EIS. In addition, on pp. 116-117, the EA states that the Project would involve a massive level of logging road construction (22 miles) and reconstruction (150 miles).

An EIS Must Be Prepared Due to Similar Actions and Cumulative Effects

Page 8 of the EA proposes 235 miles of roadside hazard tree logging, which is in addition to the recently approved Sierra Scenic Byway Hazard Tree Abatement Project. Because these two projects present significant cumulative effects (40 CFR 1508.1(g)), this is yet another reason an EIS is necessary. The EA (p. 17) states that the Forest Service removed most of the 235 miles of roadside logging from the proposal, and that it would instead be done through the R5 Hazard Tree proposal, but does not specify how many miles of the 235 remain in this project. Moreover, the EA appears to contradict itself. On p. 8, the EA still describes the 235 miles of roadside logging as being part of the proposed action, and mentions that it would be "in conjunction" with the R5 Hazard Tree project. It is unclear what this means and the EA does not elucidate.

The EA Fails to Take a Hard Look at Impacts and Fails to Adequately Analyze Cumulative Effects

Nowhere does the EA divulge the degree or intensity of tree removal that would occur in the 53,000 acres of commercial thinning areas or the effect this would have on Pacific fisher denning/resting habitat, including canopy cover or basal area. Similarly, nowhere is there any site-specific analysis of impacts, or any analysis of adverse impacts, of the massive proposed logging operations to Pacific fishers, Spotted owls, or Black-backed woodpeckers. For example, the "analysis" regarding impacts to Spotted owls (a Sensitive Species) is as follows (p. 60 of EA): "The proposed action, including design features and limited operating periods would provide protection to raptors, but short term or temporary impacts could still take place in portions of their habitat due to noise disturbance from activities." The Wildlife report (pp. 16-17) concludes that the vast amount of logging that is planned will not contribute to a trend toward ESA listing for the Spotted Owl, but does so by omitting any mention of the research finding that post-fire logging of snag forest habitat, created by high-severity fire, causes severe population reduction of Spotted Owls (Hanson et al. 2018, Lee 2020, Hanson et al. 2021).

As discussed above, abundant scientific evidence concluding the post-fire logging and commercial thinning do not stop weather/climate-driven fires, and tend to increase rate of fire spread and overall severity and tree mortality, are ignored and omitted by the EA and its assessment of public safety. Thus, the EA fails to adequately analyze the impacts of the proposal on public safety.

The EA repeatedly cites to Coppoletta et al. (2016) to promote post-fire logging, and creation of tree plantations, in mature forests that experienced high-severity fire, but the EA misrepresents that study. First, Coppoletta et al. (2016) reported that, when wildfires re-burn in subsequent wildfires (in the absence of post-fire logging), the high-severity fire percentage decreases from an initial average of 21% down to only 9% in the re-burn (see Fig. 3 of Coppoletta et al. 2016). Second, while Coppoletta et al. (2016) did report that high-severity fire patches in mature forest have somewhat higher fire severity than other areas when they re-burn, the authors nevertheless reported mostly low/moderate-severity fire effects in such reburns. Third, and perhaps most importantly, Coppoletta et al. (2016) did not investigate what happens in re-burns following earlier post-fire logging. Even studies that have found somewhat higher fire severity in high-severity reburns compared to the rest of the landscape have reported that re-burns in post-fire logged areas have significantly higher fire severity than high-severity fire patches with no post-fire logging that re-burn (Thompson et al. 2007).

The EA omits any mention of well-known research finding significant adverse impacts of post-fire logging on imperiled California spotted owls, and neutral or positive effects of big fires on spotted owls in the absence of post-fire logging (Hanson et al. 2018, Lee 2020, Hanson et al. 2021).

The EA omits mention of recent research conducted by Point Blue (Fogg et al. 2022) finding that post-fire logging in the Sierra Nevada results in far more declines in complex early seral forest bird species than increases (3 to 1 ratio of declines to increases).

The EA also omits mention of additional Point Blue research, which finds that herbicide spraying in post-fire logged and planted areas was completely ineffective at promoting post-fire conifer regeneration and, in fact, conifer regeneration was numerically lower overall in post-fire logged/herbicide-sprayed/planted areas as compared to control forests that were not subjected to post-fire logging/spraying/planting (Point Blue 2021, see Figs. 3c and 3d). Similarly, the EA omits any mention of research finding abundant post-fire conifer regeneration in the interior of large, unmanaged (no post-fire logging, herbicide spraying, or planting) high-severity fire patches (Hanson 2018, Hanson and Chi 2021).

The EA is a Programmatic Analysis, Lacking Site-Specific Impacts Analysis, and Subsequent Site-Specific NEPA Analysis Must be Conducted Prior to Any Logging

Based on the foregoing, and the following, the EA lacks site-specific analysis and information regarding specifically what activities (and their intensity) would be conducted where, and what the impacts of those choices would be in any given area. For example, as discussed above and below, there is no specific information or analysis regarding the location of known Pacific fisher den or rest sites, or detection locations, and there is no information or analysis of the location of known Spotted owl nest and roost sites, or the likely impacts of planned logging on these fisher and spotted owl sites. The EA functions essentially as a scoping notice, not even an environmental assessment. It is a programmatic plan, for which site-specific NEPA analysis in EAs or EISs would have to be later conducted prior to any implementation. Underscoring the programmatic nature of this document, the EA repeatedly refers to "subproject" areas and shows such areas on maps in the appendices.

<u>The EA is Incomprehensible</u>

As discussed in greater detail above, the EA contradicts itself, claiming that 53,000 acres of forest must be commercially "thinned" ostensibly because they exceed "desired" forest density, but the EA elsewhere acknowledges that only 21,000 acres of forest were denser than "desired" conditions prior to the Creek fire, and this acreage figure would of course be considerably lower after the fire killed trees in this 21,000 acres (but the post-fire density is not disclosed).

The EA, on p. 114, admits that it fails to even identify the areas where post-fire cutting and commercial thinning—i.e., logging—would occur: "The specific areas which sawlog or biomass removal would be used as a tool or method for these treatments have not been identified."

Similarly, the EA, on p. 105, admits that it fails to identify how many snags would be removed, versus retained for snag-dependent MIS wildlife (like Black-backed Woodpeckers), in the areas where post-fire logging would occur: "We would adopt snag retention guidelines ***during*** tree felling and removal that retain adequate number of large snags and logs." (emphasis added) This is a major problem for a species that depends upon dozens or hundreds of medium and large snags per acre, typically across hundreds of acres, to have enough food to survive and feed their young (Hanson and North 2008, White et al. 2016, Hanson and Chi 2020).

The EA refers to "priority areas" where it claims implementation of proposed actions is more likely. In the Creek fire EA, on p. 14, it says that the "priority or near-term treatment areas have been delineated and mapped", referencing Tables 1 and 2; and maps 17-23 of App. 1 show the boundaries of the priority "subproject treatment areas". On p. 15 of the final EA, it states the following:

1. Narrow from subproject area boundary and preliminarily determine treatment or activity to be applied within units

But nowhere does the EA show where these actual planned management areas are located—i.e., the units that have been "narrowed" from the subproject boundary areas shown in maps 17-23 and where the Forest Service has determined the specific "treatment or activity to be applied within units" in those narrowed subsets of the subproject treatment areas.

The remaining >100,000 acres the EA says may or may not be implemented, depending on future ecological conditions and funding, etc., and even if implemented the EA says in these other areas (outside of the "priority" areas) it is uncertain what implementation would look like and that will be determined years from now (see EA pp. 7-18). On these same pages, the EA states that only a minor subset of the 68,000 acres of "reforestation" and 53,000 acres of commercial thinning (termed "resilience") is actually intended to be implemented as part of the "priority" areas in Tables 1 and 2, but nowhere in the EA or its maps does it show the location of such areas. The EA, on p. 10, describes three different reforestation "pathways" that ostensibly would apply to different areas that comprise the 68,000 acres of proposed "reforestation", but the EA does not divulge where the three different pathways would be applied on the landscape. Similarly, on p. 11 the EA states that, with regard to the 53,000 acres of commercial thinning under the rubric of "resilience", the treatment would be logging (sawtimber sale and removal, along with removal of smaller-diameter biomass) while in other areas the EA indicates that treatment would be prescribed fire that would not involve logging, but the EA and its maps do not divulge where one treatment approach versus the other would occur, or why. In App. 2, on p. 111, the EA describes the 53,000 acres of commercial thinning as "possible treatment areas". On pp. 10 and 102, regarding the three different reforestation "pathways", the EA only mentions burning of slash debris with regard to pathway 3, and there is no clear indication that slash burning would occur (via pile burning or broadcast burning, or other burning) in pathways 1 and 2; nor is there any map showing where the three pathways would be actually applied. Therefore, it appears that much or most of the post-fire logging that would be conducted under the rubric of "reforestation" would leave logging slash debris on the ground, unburned, which would dramatically increase fire severity (*Sierra Club v. Eubanks*, 335 F.Supp.2d 1070 (E.D. Cal. 2004) (https://scholar.google.com/scholar_case?case=10865898153800326091&q=sierra+club+v+eubanks&hl=en&as_sdt=2006).

In another example, on pp. 103-104, the EA states that assessments and determinations about which areas would need "reforestation" would be made after implementation began and would be based on whether "stocking surveys" found sufficient natural post-fire conifer regeneration. The reader has no way of knowing what the Forest Service actually plans to do where. The EA describes possible actions and activities that may or may not occur at all, and a range of different types of management that might possibly be implemented, or not, on any given area.

The lack of specificity, the contradictions, the uncertainty and general vagueness of the Draft EA violates NEPA. *California v. U.S. Forest Service*, 465 F.Supp.2d 942 (E.D. Cal. 2006) (https://scholar.google.com/scholar_case?case=15627877435829679221&q=Lockyer+v+Forest+Service+sequoia&hl=en&as_sdt=2006).

The EA Fails to Take a Hard Look at Climate Change Impacts from the Project

On pp. 31-32 of the "Fuels, Fire, Air Quality, and Climate Change" report, the Forest Service makes the following unsupported statement (similar statements, also with no supporting references or evidence, are made in the EA):

> If fuels are not treated, the decaying process would slowly release the carbon stored in the dead plant tissue into the atmosphere over several decades or until the next wildfire or prescribed fire reduces a portion of the fuels. Fuel reduction treatments would remove carbon from the site and reduce carbon stored on the site in the form of dead vegetation. In the short-term, proposed fuel treatments would reduce stored carbon, but it would be in

> less amounts compared to the large reductions caused by the Creek Fire. In the long-term, reforestation and maintenance of a green growing forest through fuels and forest stand treatments would stabilize carbon storage and may slowly increase storage over time. However, to maintain a more stable carbon storage regime, forested areas would need to be burned under conditions and in intervals that closely mimic the natural range of variation (variability) for the fire regime types in the Creek Fire area.
>
> Dead standing trees and fallen trees will store carbon over decades and slowly decompose releasing carbon into the atmosphere and the release of carbon, or greenhouse gases, would increase in the next fire. Logging slash that is burned on site would release most of the stored carbon as greenhouse gases. Trees that are removed and milled into building lumber would both store carbon and produce greenhouse gases. Wood products that are used for building construction and other purposes would store carbon for many decades and slowly decompose releasing carbon into the atmosphere. Lumber mill processing waste would most likely be burned for energy generation purposes releasing the stored carbon into the atmosphere.

Neither this report nor the EA itself provides evidence or sources to back up these vague statements, and both omit any reference to Harmon et al. (2022), which found that only about 1.2% of the live tree carbon was actually consumed in the Creek fire (and Rim fire), or Campbell et al. (2016), which reports that post-fire carbon emissions from decay of snags is extremely small and slow each year, or Bartowitz et al. (2022), which found that commercial thinning emits about 3 times more carbon per acre than wildfire alone and it increases overall tree mortality.

Table 13 of the report assumes that 100% of the carbon in dead trees in the areas proposed for post-fire logging will be emitted into the atmosphere, but provides no basis for this and no information on the timeline—100 years? 200 years?—while the table baselessly claims almost no carbon emissions from the post-fire logged areas by simply omitting inclusion of the carbon emissions that occur after dead trees are logged and removed from the forest. Those carbon emissions are well over two-thirds of the total tree carbon, if the tree is felled for sawtimber (Ingerson 2007, Hudiberg et al. 2019) or 100% if the tree is felled for biomass energy (Sterman et al. 2018)—and those carbon emissions occur almost immediately (within the next few years), during the peak of the climate crisis, unlike natural decay, which occurs over many decades and centuries (Campbell et al. 2016). If a re-burn occurs within the next few decades, which it very well may not, only a minor portion of dead tree carbon (snags and downed logs) is consumed overall (Campbell et al. 2007), unlike planned logging, which will put the great majority of the dead tree carbon into the atmosphere within the next few/several years. This is so, since most of the tree carbon (comprised of branches, tree tops, bark, round portions, mill residue from sawmill blades) is burned for energy or on site and only a small percentage is useable for lumber (Ingerson 2007, Hudiberg et al. 2019).

<u>The EA's Response to Comments Fails to Take a Hard Look</u>

The EA's Response to Comments document, on p. 7, fails to take a hard look at the dozens of scientific sources that we submitted indicating that the proposed logging will increase overall wildfire severity and increase threats to the local communities, while being completely unnecessary to manage future wildfire with additional fire, such as prescribed burning. The Response to Comments document responds to decades of research and scientific opinion contradicting the Forest Service's assumptions with the following perfunctory statement: "We have updated the environmental assessment with clarifying language; conclusions have not changed. Literature has been considered." This violates NEPA's hard look requirement.

Further, also on p. 7, the Response to Comments document cites Jones et al. (2020) for the proposition that this article promotes post-fire logging. There are two Jones et al. (2020) articles and neither promotes post-fire logging.

Significant New Information

After the Draft EA comment period was over, the Steel et al. (2022) study was published and released. Figure 2a of that study reports (in purple) forests that "transitioned" to non-forest due to high-intensity natural disturbances, including both fire and drought/beetles. Comparing Fig. 2a of Steel et al. (2022) to Figures 18 to 23 of the EA (and especially Figures 20 to 23) reveals that the "resilience" polygons (in green) on the EA maps (the areas proposed for commercial thinning in the "near-term treatment areas" ostensibly because they are too dense with live trees) are largely in areas that Steel et al. (2022) mapped in purple, indicating non-forest. Either the EA's maps are dramatically incorrect, and these "resilience" polygons actually represent additional proposed post-fire logging of mostly snag forest habitat, or Steel et al. (2022) is wrong and has erroneously mapped vast areas of live, dense, green forest as having transitioned to non-forest due to most of the trees being killed by natural disturbances. The Final EA does not address this major discrepancy, which has major implications for impacts to the habitat of endangered Pacific fishers.

Sincerely,

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