**René Voss – Attorney**
Natural Resources Law
15 Alderney Road
San Anselmo, CA 94960

renepvoss@gmail.com
Tel: 415-446-9027

**PROTECTING NATURAL RESOURCES**

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Teresa Benson – Sequoia Forest Supervisor
Steven Caracciolo, Vegetation Program Manager
Sequoia National Forest/Giant Sequoia National Monument
1839 South Newcomb Street
Porterville, CA 93257

cc: Ara Marderosian
Stephen Montgomery
Alison Sheehey
Eric La Price
Susan Durham
Aaron Isherwood, Sierra Club Environmental Law Program

**Subject: Castle Fire Restoration Project Scoping Comments for SFK & SC**

Sequoia ForestKeeper (SFK) and the Kern-Kaweah Chapter of the Sierra Club (SC) thank you for the opportunity to comment on the subject proposal. SFK and SC have been involved in the protection of the Sequoia National Forest and the Giant Sequoia National Monument for many decades and consider the subject proposal, in combination with the recent roadside hazard tree proposal in the same fire area, as perhaps the most important and potentially most destructive proposals on the forest's ecosystems, the Monument objects and values, and the wildlife that depend on the forest habitats of the Sequoia.

Background and Description of Proposal

On August 19, 2020, one or more lightning strikes naturally ignited the Castle Fire (aka, the SQF Complex Fire), which burned through roughly 175,000 acres, including approximately 148,900 acres of the Sequoia National Forest, the Giant Sequoia National Monument, and the Golden Trout Wilderness. The fire burned through ten giant sequoia groves and numerous recreation sites, mostly in the Western Divide Ranger District, although it also burned north into Sequoia National Park, adjacent lands managed by the Bureau of Land Management, the Kern River Ranger District, the Inyo National Forest, the Mountain Home State Forest, and various private inholdings. *See* Land Ownership Map. The Castle Fire is the largest fire to date within the boundaries of the Giant Sequoia National Monument (GSNM) and represents the first true test of the ecological restoration and protection provisions of the 2012 GSNM Management. Large portions of the Castle Fire area as well as certain roads and trails will remain closed to the general public, with certain exceptions, through the end of 2021. *See* Closure Order.

According to the Forest Service's Burned Area Evaluation Report (BAER), the vast majority of Castle Fire's soils burned at very low/unburned-, low-, and moderate-severity (94%), with only 6% of the soils burned at high-severity. *See* BAER Map, p. 20 (Oct. 23, 2020). Most of the high-severity burned areas are located along the Western Divide, to the east of Camp Nelson and to the west of the Kern River. Analysis of the vegetation burn severity (RAVG) is preliminary and ongoing, but the preliminary RAVG GIS data is available for download. *See* Castle Fire RAVG ZipFile (90mB).

According to the January 26, 2021, scoping letter, the Forest Service has proposed "ecological restoration" both inside and outside the GSNM in areas outside Wilderness. It plans to allow Wilderness lands to naturally recover. The scoping notice asserts that approximately 50,000 acres within the project area burned at moderate to high severity, causing extensive tree mortality, while the rest of the area burned at very low or low severity. The varied burn severity resulted in a mosaic burn pattern from 100% tree mortality to areas supporting a green tree component.

The purpose of the project is to treat areas where natural regeneration is unlikely, including the removal of dead and dying trees, as well as planting and seeding, with the goal of re-establishing conditions that provide wildlife habitat more resilient to drought, insect/disease outbreaks, and high-severity fire. The scoping notice asserts that without specific management action, such as planting and seeding, native vegetation would be outcompeted by invasive plants. To be successful, the scoping notice asserts that the Forest Service must remove dead and dying trees and treat competing vegetation to provide space for the planted trees, keep seedlings safe from falling trees, and ensure the safety of the forest workers, while also, helping protect the remaining live trees, including giant sequoias, from the falling dead trees and high severity wildfire that could occur from the fuels build-up if the dead and dying trees are not removed.

More specifically, the Forest Service proposes to fell and remove dead or dying trees using mechanical ground-based equipment. It proposes to sell the felled trees with commercial value for sawtimber or biomass and chip, lop, scatter, pile, and burn the rest, leaving some downed trees for erosion control and downed woody material to meet wildlife standards.

The proposal would also fall and remove dead, dying, and even live trees in the Wildland Urban Interface (WUI) defense zones, such as ladder fuels in low-severity burned areas. It would then plant native conifers to supplement natural regeneration. Planting activities would include site preparation, planting seedlings, and "release" (or reducing competition) of those seedlings using hand and mechanical methods, as well as chemical treatments, meaning herbicides. To reduce high fuel loading from logging, the proposal would also conduct pile and understory burning.

Finally, the proposal would allow the construction of new temporary roads, as necessary, to implement restoration activities and would repair and maintain existing roads.

Although related, the proposal does not provide any detail about how it relates to the separate plan to fell and remove hazardous trees in and around recreation sites and along 130 miles of roadway within the Castle Fire area. That proposal would fell and remove hazard trees up to 300 feet from each side of the road, which alone amounts to roughly 9,450 acres (= (600 feet x 130 miles x 5,280 ft/mile)/43,560sq. feet/acre). Felled trees would be chipped, masticated, lopped and scattered, pile burned, removed for wood products such as timber or biomass, personal or commercial firewood, or other similar means of processing and/or removal. *See* Scoping Letter, pp. 1-2 (Exhibit A). The Forest Service plans to exempt that proposal from a full NEPA analysis using categorical exclusions (*see* Exhibit B), presumably for road and facilities maintenance, and anticipates completion of the environmental analysis and hazard trees mitigation in 2021 and 2022. *See* Exhibit A. SFK and SC have warned the Forest Service that its proposal would violate the Ninth Circuit's recent holding in *EPIC v. Carlson*, 968 F.3d 985 (9th Cir. 2020).

COMMENTS

SFK and SC urge you to consider the following specific comments, but also request that you provide a comment period once the proposal is refined and before the 30-day comment period.

Because the proposed actions would result in significant adverse effects on soils, wildlife, recreation, aesthetic resources, and proposes to remove many thousands of trees from and build new roads in the Giant Sequoia National Monument, the Forest Service must prepare an Environmental Impact Statement (EIS).

The Forest Service plans to implement its restoration project "where natural regeneration is unlikely." The forests in the Sierra Nevada, however, have recovered on their own for millennia, and unnecessary "restoration" is applied all too frequently, doing more harm than good. Restoration is only needed to stabilize slopes from extreme erosion and to help retain woody material and ash on slopes as the necessary nutritional components for regeneration. Infusing wattles with native seeds might accelerate natural regeneration on south-facing slopes.

As an example of post-fire natural regeneration, consider the Rim Fire area of Stanislaus National Forest where, after 7 years, conifer and woody plant regeneration abounds in all but some south-facing slopes. Yet the Forest Service believes it must clear the recovering vegetation to save it. The following link to a Scientific American video, featuring fire researchers Valerie Troute and Dr. Chad Hanson, explains how large fires are not unusual and that natural regeneration in large burned areas abound, far from surviving seed trees: https://www.youtube.com/watch?v=UkT1GFBQPoU&feature=emb_imp_woyt

Unproven assertions in the proposal suggest that removing dead and dying trees, combined with restoration efforts, including planting and seeding, would re-establish healthy forest conditions that provide wildlife habitat. The proposal also asserts, without support, that restored conditions would be more resilient to drought, insect/disease outbreaks, and high-severity fire. Instead, a mosaic of burned forest habitat is natural and necessary to provide foraging habitat for many species including the endangered Pacific fisher. But mechanically disturbing burned forest habitat interrupts the normal course of natural restoration following wildfire with ground disturbing activities that harm fisher denning and foraging habitat and adversely affect habitat for California spotted owls and Northern goshawks.

A recent scientific paper (Atchley et al. 27 January 2021, titled "Effects of fuel spatial distribution on wildland fire behavior") states that basic landscape-treatment rules that the Forest Service is currently applying to create more fire-resilient landscapes are incomplete and are likely increasing, not decreasing wildland fire danger. *See* https://www.publish.csiro.au/WF/WF20096. Consequently, the Forest Service must take a different approach, especially in the GSNM, where ecological restoration must be guided by science, and the Forest Service is not allowed to fell or remove trees unless it shows that it is "clearly needed" to benefit the ecosystem.

Scientific evidence suggests that these burned forest habitats should recover with minimal human intervention and should be left alone to provide undisturbed habitat for wildlife.

1. The Castle Fire achieved much of the ecological restoration prescribed in the GSNM Plan, and the proposal must acknowledge this fact as a premise in any analysis.

When the naturally-ignited Castle Fire started burning in the GSNM, it accomplished one of the primary goals of the Monument Proclamation and GSNM Plan: "ecological restoration" through managed wildfire. *See* GSNM Decision Tree, p. 83; GSNM Tables 10 & 19 (#13 & #9, respectively). The analysis going forward must start with that premise and seek to ensure that any proposed treatments do not undo the ecological restoration already achieved by the fire, including areas that burned with moderate to high severity. With respect to ecological restoration in the Monument, the GSNM includes no other provisions that authorize some of the restoration activities, since the fire already achieved most of them. The GSNM plan acknowledges this natural restoration from wildfires:

> Wildfires are caused by natural ignitions, such as lightning, or some type of human interaction. The term "managed wildfire" refers to the use of wildfires started by natural ignitions to protect, maintain, and enhance resources, and, whenever possible, allow fire to function in its natural ecological role. This is one tool used to restore and maintain the natural fire regime. … Managed wildfire can be used as a tool to reintroduce fire to the ecosystem, reduce unnatural fuel accumulations, and promote resilient forest structures under appropriate conditions (Fites-Kaufman 2005).

GSNM Plan, p. 80. Although the fire tragically burned into some of the surrounding communities and burned structures, the Castle Fire achieved these goals, by introducing fire to the ecosystem, reducing fuel accumulation, promoting resilient forest structure. Even though the fire did not burn during ideal conditions, it nonetheless achieved many the GSNM Plan's goals.

2. The proposal must be consistent with the Ecological Restoration provisions in the GSNM Plan and those expressed in the SAB Advisories & in the GSNM FEIS Chapter 4, pp. 392-408.

    a. The Castle Fire itself has accomplished several of the strategies for ecological restoration in the GSNM Plan, pp. 46-47 (Table 10)

Table 10, Strategy #13 states: "Promote resiliency in Monument ecosystems by using the following tools, in order of priority: managed wildfire (when available), prescribed fire, mechanical treatment. (1)" Note (1): "Consistent with the Decision Tree narrative (pp. 82-84), whenever naturally-ignited wildfires occur and are available to manage for resource benefits, those managed wildfires will be used first for ecological restoration." The Castle Fire essentially achieved this resiliency strategy, which burned as a naturally-ignited wildfire.

Strategy #10 states: "Encourage natural regeneration of tree species, including giant sequoia. In areas where natural regeneration is not likely, use planting as determined in site-specific project analysis." It is too early to tell whether natural regeneration is "not likely." And planting should not be proposed until the site-specific project analysis has made such a determination. It will likely take at least two growing seasons to adequately analyze whether natural regeneration is

unlikely. So it would be premature to move forward with planting and associated activities until this analysis is completed.

b. There is nothing in the ecological restoration strategy (Table 10) or anywhere else in the plan about post-fire logging for restoration.

None of the other strategies in Table 10 apply to a post-fire area, since fuels have been reduced substantially from the fire itself, and the other strategies do not apply. Moreover, there is nothing in the entire GSNM Plan that authorizes the felling and removal of trees in support of planting. Instead, the restrictions with regard to felling and removal of trees unless "clearly needed" provide sufficient standards to restrict these activities for ecological restoration.

c. Under Fire & Fuels, ecological restoration strategies have been met (GSNM Plan, pp. 49-49, Table 19.

Strategy #9 states: "Manage some high-intensity fires on a limited basis and tolerate relatively high mortality to reduce fuels or to improve the diversity of vegetation and habitat characteristics in the Monument.") According to the BAER report, high burn severity was only 6%, which is consistent with this strategy to reduce fuels. The RAVG data likely also supports this strategy, which sometimes overstates the amount of high mortality, but that is acceptable here as high intensity burn severity is meant to be tolerated.

Strategy #7 states: "Restore fuel conditions to allow fire to burn in its characteristic pattern and allow fire to resume its ecological role." The fire has likely also played its role to meet this strategy, since it burned in a mosaic pattern and characteristic, to create ecologically-needed diverse habitats.

The fire likely also achieved the goal in Strategy #10 by reducing fuels in the WUI defense and threat zones, giant sequoia groves, and old forest emphasis areas.

d. Meet the requirements of GSNM, p. 79, Table 46 for old forest emphasis areas, owl & goshawk PACs, sequoia groves, and avoid carnivore den sites

There are no exceptions to restrictions and diameter limits in Table 46 for ecological restoration with regard to burned trees, and those limits must be strictly adhered-to. Given the many owl and goshawk PACs, sequoia groves, and carnivore den sites, the avoidance and six-inch diameter limits must be carefully applied, if any tree felling or removal can be justified, at all, given the "clearly needed" standard.

3. <u>Post-fire tree removal is not "clearly needed" for ecological restoration, under the GSNM Proclamation & GSNM Plan because tree felling and removal would set back natural regeneration/restoration for decades</u>.

Felling trees and using heavy equipment to remove trees will harm seedlings that are trying to naturally re-establish in burned areas, and would remove the shade needed for these seedling trees to retain moisture and reestablish naturally.

There is no justification provided in the GSNM Plan or the Monument Proclamation for removing dead or dying trees from the Monument for ecological restoration after a fire, especially as proposed here, in order to assist in reestablishing seedlings and reforestation. In fact, removal of trees using mechanical methods will likely hinder natural ecological restoration both in the short- and the long-term. For those reasons, the felling and/or removal of dead or dying trees is not "clearly needed" for ecological restoration or maintenance.

An analysis of regeneration and post-fire logging after the Biscuit Fire in southern Oregon found that post-fire logging had significant adverse effects on natural seedling regeneration and restoration:

> Natural conifer regeneration on sites that experienced high-severity fire was variable but generally abundant, with a median stocking density of 767 seedlings per hectare, primarily of Douglas-fir (*Pseudotsuga menziesii*) (Fig. 1A). Such density exceeds regional standards for fully stocked sites, suggesting that active reforestation efforts may be unnecessary. *Postfire logging subsequently reduced regeneration by 71%, to 224 seedlings per hectare (Fig. 1A), due to soil disturbance and physical burial by woody material during logging operations. Thus, if postfire logging is conducted in part to facilitate reforestation, replanting could result in no net gain in early conifer establishment.*

Donato et al. (2006) (Exhibit C) (emphasis added). To make matters worse, Donato found that "Postfire logging significantly increased both fine and coarse downed woody fuel loads," and that follow-up treatments to deal with these fuels was generally not feasible unless the areas were treated by prescribed burning, which would also set back any new seedling regeneration, which would likely be killed by prescribed fire. *Id.* It concluded that "the lowest fire risk strategy may be to leave dead trees standing as long as possible (where they are less available to surface flames), allowing for aerial decay and slow, episodic input to surface fuel loads over decades." *Id.*

A more recent scientific analysis also found that post-fire logging and associated skid trails and historic logging in the Rim Fire area of the Stanislaus National Forest had significant adverse effects on natural seedling regeneration. Hanson and Chi (2021) (Exhibit D) found support in the Forest Service's own analyses that post-fire logging inhibits natural regeneration, "given that post-fire logging kills most natural conifer regeneration; USFS, 2016." *Id.* at 2-3 (citing the Rim fire reforestation final environmental impact statement. U.S. Forest Service, Stanislaus National Forest. Sonora, California, USA.); USFS, 2016, Exhibit E, p. 239 ("Salvage and fuels reduction operations can reduce survival of naturally regenerating conifer seedlings through soil disturbance and physically burying seedlings in woody material (Donato et al. 2006)").

Moreover, Hanson and Chi's analysis of natural regeneration found that logging in the decades prior to the Rim Fire had significantly set back natural regeneration:

> An additional 53 plots of the initial 169 did not meet our study criteria because, while they were historically forested, conifers had not grown in these locations for approximately one to four decades prior to the Rim fire, due to soil damage associated

> with past logging activities, such as logging roads, skid trails, landings, and logging slash pile burn sites. Thus, 34% of the historically forested landscape (53 out of 155 plots) did not support conifer tree cover at the time the Rim fire occurred due to past logging impacts.

*Id.* at 3. This logging damage occurs from mechanized equipment on forest soils, compacting, eroding, and reducing the soil's productivity, which is even more significant after a fire:

> Evidence continues to mount of a direct relationship between mechanical disturbance to the postfire environment and accelerated erosion (Kattleman 1996; McIver & Starr 2000, 2001). Soil compaction can persist for 50–80 years in many forest soils (Quigley & Arbelbide 1997) and even longer in areas with high clay content, which is substantially longer than the negative influence on soils that may be associated with fire (U.S. Department of Agriculture Forest Service & BLM 1997).
>
> *Because soils and soil productivity are irreplaceable in human time scales, postfire management practices that compact soils, reduce soil productivity, or accelerate erosion should not be undertaken or allowed to continue.*

Beschta et al. (2004) (Exhibit F) (emphasis added). Thus, mechanical equipment in the Castle Fire area would likely inhibit forest regeneration through soil compaction, erosion, and associated loss in productivity and is inherently inconsistent with the goal of ecological restoration. Therefore, the Forest Service must prohibit the use of mechanical equipment throughout the fire area.

4. <u>Planting is not necessary for ecological restoration.</u>

After Hanson and Chi eliminated areas that had previously been logged, they found that post-fire conifer regeneration was abundant, even when some areas were located at a substantial distance from surviving seed trees:

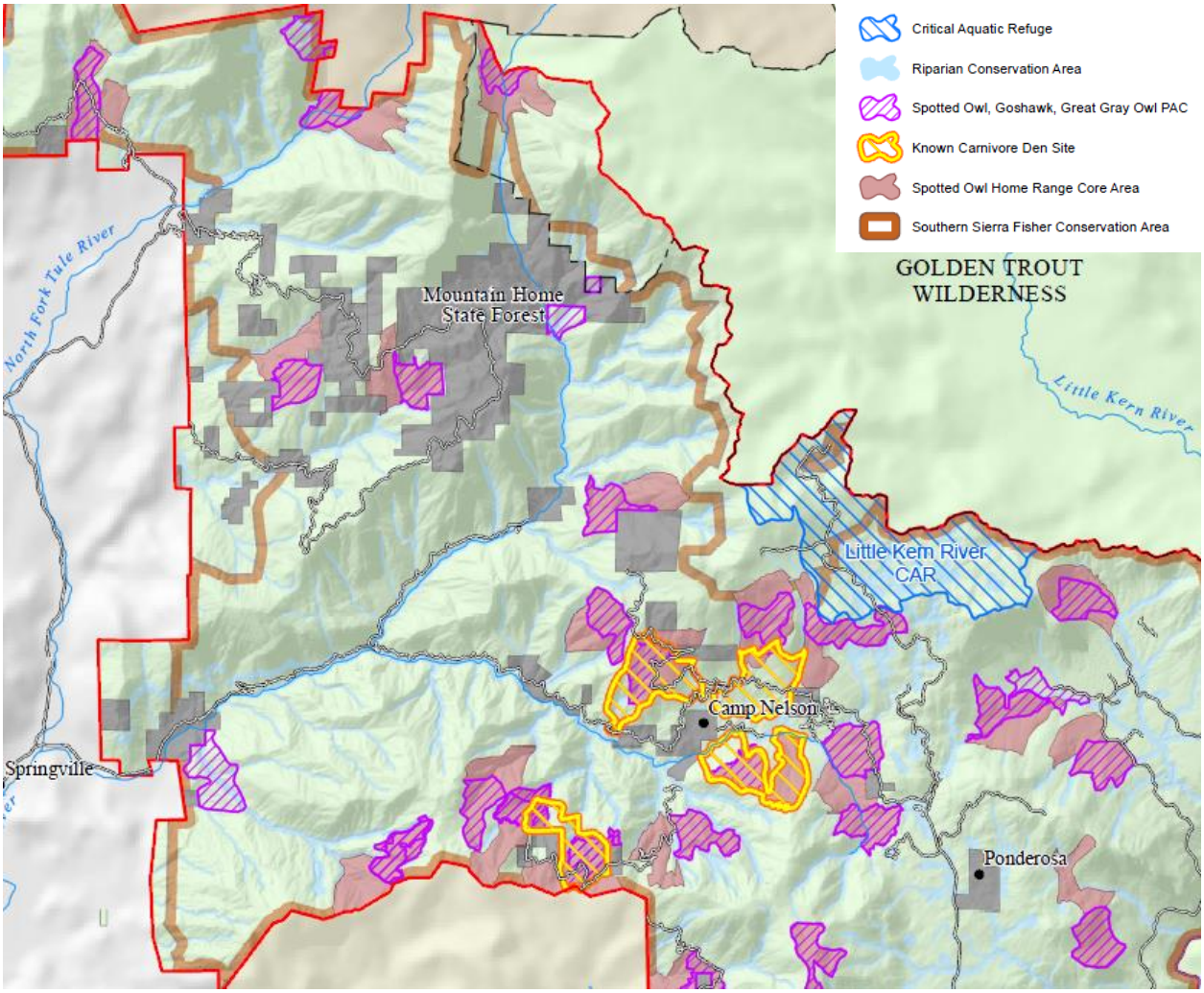
> Post-fire conifer regeneration in the Rim fire was highest near live-tree edges, but we found substantial post-fire conifer regeneration at all distances from surviving conifers. Even in locations farthest into the interior of large high-severity fire patches, >300m from the nearest surviving conifer, density of natural post-fire conifer regeneration was 256 stems/ha, which is in the mid-range of recently-articulated values associated with successful post-fire conifer regeneration (North et al., 2019). We did not find any effect of distance from surviving conifers on the proportion of conifer regeneration comprised by pine species, contrary to Hanson (2018), and our results contradict the hypothesis adopted by USFS (USFS, 2004, 2016) suggesting conifer regeneration that occurs in large high-severity fire patches will be dominated by fir/cedar species. In plots >300m from surviving conifers, over three-quarters had post-fire regeneration that was pine-dominated. Our results support the North et al. (2019) conclusion, based on a synthesis of recent scientific findings about post-fire conifer regeneration, recommending that land managers consider high-severity fire areas within 200m of live trees to be capable of natural regeneration, and consequently not in need of human intervention.

*Id.* at 5 (Exhibit D).

As stated earlier, it may take more than one growing season to determine whether large high-severity patches are naturally regenerating, and the analysis requires that type of patience before managers go into these areas to replant. From both a short- and long-term perspective, it is best to give the forest sufficient time to recover on its own, and the GSNM Plan requires it.

5. <u>The proposed actions will likely harm the endangered Pacific fisher, Little Kern golden trout, spotted owls, and goshawks</u>.

The proposed treatment areas contain significant wildlife areas, including spotted owl and goshawk PAC, known carnivore denning areas, and Pacific fisher habitat, and Little Kern golden trout that could be harmed by proposed logging. The GSNM Plan Map B, pasted below, shows some of these habitat areas within the Castle Fire area:




Moreover, the entire project area is within the Southern Sierra Fisher Conservation Area, and because the fisher is listed under the ESA as endangered, additional restrictions apply.

The proposed actions must strictly apply the wildlife restrictions and sufficiently analyze potential adverse effects on these and other species. Because the effects from the proposed tree felling and removal activities, the related hazard tree proposal along roads, combined with the changed baseline environmental effects from the fire, are significant, the Forest Service must prepare an EIS and consider a full range of alternatives that minimize adverse effects.

6. Green/Scorched Tree Survival – analysis must be done after a growing season reveals surviving trees

Scientific evidence shows that trees, especially pines, can survive even if 100% of the foliage is burned, and that many scorched trees will flush the next year and survive a fire. According to the Forest Service's own publication on the issue, this is likely to occur:

> With growing debate over the impacts of post-fire salvage logging in conifer forests of the western USA, managers need accurate assessments of tree survival when significant proportions of the crown have been scorched. The accuracy of fire severity measurements will be affected if trees that initially appear to be fire-killed prove to be viable after longer observation. … We found that, among ponderosa pines (*Pinus ponderosa* Dougl. ex. Laws) and Jeffrey pines (*Pinus jeffreyi* Grev. &Balf) with 100% initial crown scorch (no green foliage following the fire), the majority of mature trees flushed, and survived. Red fir (*Abies magnifica* A. Murr.) with high crown scorch (mean=90%) also flushed, and most large trees survived. Our results indicate that, if flushing is not taken into account, fire severity assessments will tend to overestimate mortality and post-fire salvage could remove many large trees that appear dead but are not.

*See* Forest Service Publication, available at https://www.fs.usda.gov/treesearch/pubs/36850 (see also Exhibit G). Although not included in the study, there is some hope that burned giant sequoias may also flush in the upcoming season, recover, and survive.

The ability to flush and the need to wait until that happens is particularly important in the Giant Sequoia National Monument where the protection of trees is a defining principle of the Monument and GSNM Plan:

> Any treatments that involve the removal of trees from within the Monument area, including both standing trees and downed logs, will only be permitted following a determination that removal of the trees is "clearly needed for ecological restoration and maintenance or public safety" (Clinton 2000, p. 24097).

GSNM Plan, p. 80 (quoting and citing to the Monument Proclamation).

So, the plan requires the Forest Service to wait and assure that, according to the science, these trees have not survived before moving forward with any proposal that may fell and/or remove any trees, since it is likely that many of them are not actually dead and will survive. The scientific findings in the cited paper above requires that the Forest Service make a determination after the growing season and on an individual tree basis before designating a tree as dead.

Without such a full analysis, the removal of these trees is not "clearly needed" and would violate the letter and intent of the Forest Plan and the Monument Proclamation.

Until then, the Forest Service must delay any action until a proper analysis can be completed.

7. Temporary road construction is inconsistent with post-fire ecological restoration and should not be allowed.

Roads cause soil erosion from greater runoff and cause permanent irreversible and permanent damage to soils, wildlife habitat, and adversely affect watersheds. Roads also increase the risk and severity of fires by opening more forest edges that dry and heat the forest; allow more human-intrusions deep into the forest resulting in human-caused ignitions.

> Accelerated surface erosion from roads is typically greatest within the first years following construction, although in most situations sediment production remains elevated over the life of a road (Furniss et al. 1991; Ketcheson & Megahan 1996). Thus, even "temporary" roads can have enduring effects on aquatic systems. Similarly, major reconstruction of unused roads can increase erosion for several years and potentially reverse reductions in sediment yields that occurred with disuse (Potyondy et al. 1991).
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> * * *
>
> Finally, road and landing construction is expensive and can siphon limited funds away from effective restoration measures, such as obliteration and maintenance. The backlog in maintenance of U.S Forest Service roads has been estimated to be several billion dollars (U.S. Department of Agriculture Forest Service 2000), and road construction inevitably adds to this seemingly insurmountable backlog. *For these reasons, the construction and reconstruction of roads and landings is not consistent with postfire ecosystem restoration.*

Beschta et al. (2004) (Exhibit F) (emphasis added).

The science cannot be more clear that even temporary road construction should be prohibited in a post-fire landscape because it is inherently inconsistent with ecological restoration.

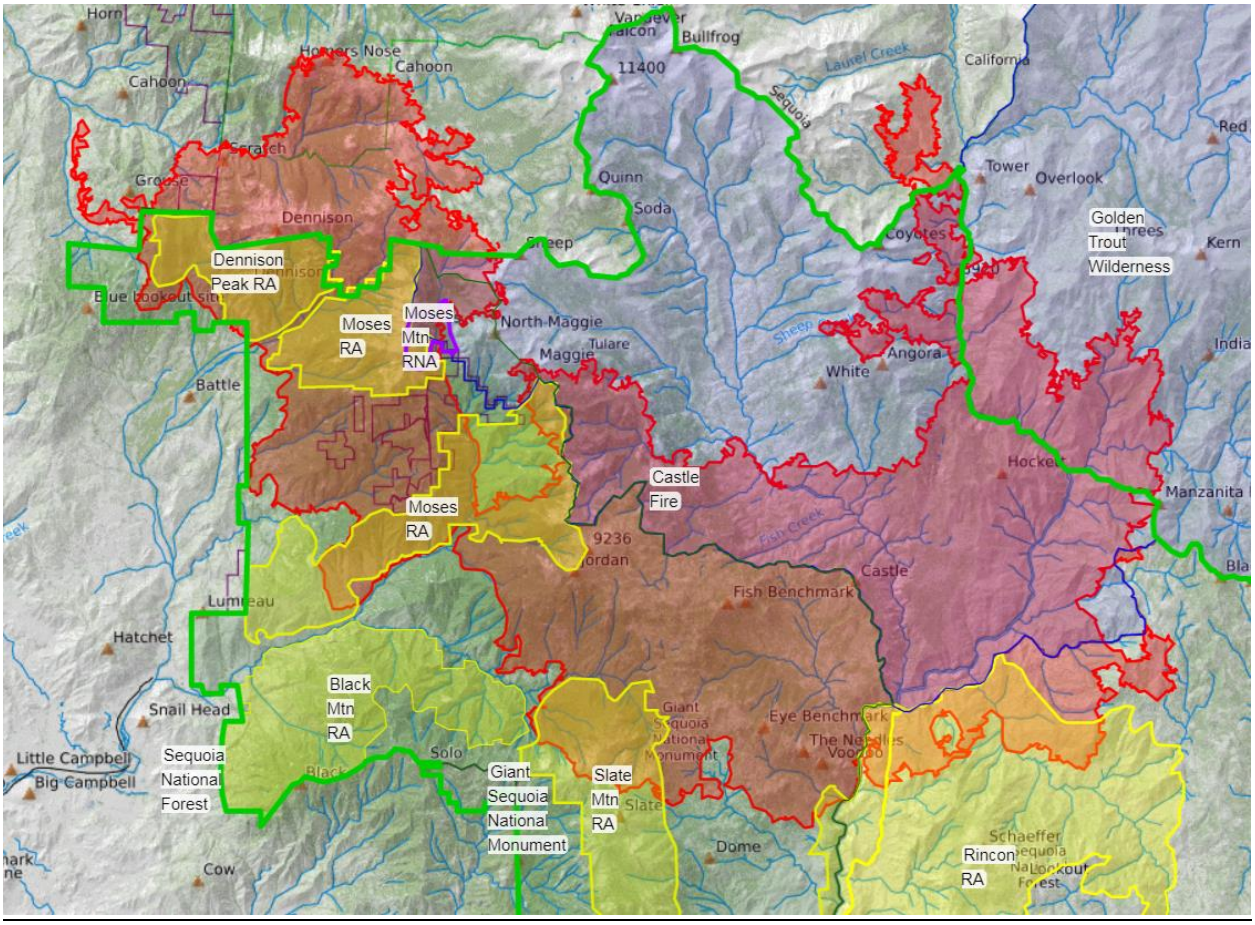
8. Inventoried Roadless Areas should be off-limits to proposed actions.

Although the proposal states that it will exclude actions within Wilderness area, we assume that this also includes the proposed Moses Wilderness Area, which the GSNM Plan protects like Wilderness in that it is to be managed as wilderness. But the proposal does not exclude management in Inventoried Roadless Areas, which are separately protected under the Roadless Rule.

"The Roadless Rule permits timber cutting only if the logging is limited to 'generally small diameter timber' and allows logging only for narrowly defined purposes such as enhancing

roadless area characteristics." *Sierra Club v. Eubanks*, 355 F.Supp. 2d 1070, 1079 (E.D. Cal. 2004), citing 36 C.F.R. 294.13(b)(ii).

The following map provides an overlay of the Inventoried Roadless Area and the Castle Fire area, showing where these additional restrictions apply. We suggest that the Forest Service also manage the IRAs similar to Wilderness by not including them in its proposal for action.




It would be difficult to imagine that any of the proposed actions, such as tree felling or removal, will "maintain or improve one or more" of the nine roadless area "characteristics" specifically itemized by the Roadless Rule. 36 C.F.R. § 294.13(b)(1), especially in areas that recently burned in the Castle Fire. If anything, felling trees would make wildfire risk worse by increasing smaller diameter fuels on the ground, having the opposite effect compared to fire risk reduction.

As the District Court in *Sierra Club v. Eubanks* stated, "the Roadless Rule does not permit logging of any kind except in narrowly specified circumstances, including efforts to reduce wildfire risk. As already discussed above, Defendants have failed to take the 'hard look' required by NEPA at scientific studies which suggest that the timber removal proposed actually increases, not reduces, fire risk. In the absence of such examination, Defendants' compliance with the Roadless Rule's directive that wildfire risk be *reduced* appears suspect. In addition, to the extent that the project may actually increase fire risk, Defendants can hardly say that the

project enhances the other main exception identified by the Roadless Rule in permitting logging; namely, to improve threatened, endangered, proposed, or sensitive species habitat. The specter of bonfire-like combustion across the landscape, as raised by Plaintiffs, would hardly meet that objective." *Id.* at 1081.

9. The proposal must protect Special Areas.

The Castle Fire area includes many special areas, which should be left alone because they have special status. These special areas are discussed in the GSNM Plan, p. 65, and include the Slate Mountain Botanical Area, the Freeman Creek Botanical Area, the South Mountaineer Research Natural Area, and the Moses Mountain Research Natural Areas. These areas should be allowed to naturally recover.

10. Fuel reduction must be focused immediately around structures, and thinning in the WUI will increase rather than decrease fire risk.

In as much any fuel reduction is necessary near communities, treatments should be focused on the immediate 100 to 200 feet surrounding structures. *See* https://wildfirerisk.org/reduce-risk/home-ignition-zone/ of Jack Cohen, Ph.D., U.S.F.S. Fire Scientist. It should not occur miles away from structures because "more than any other human activity, logging has increased the risk and severity of fires by removing the cooling shade of trees and leaving flammable debris." Sierra Nevada Ecosystem Project (SNEP 1996), available at https://pubs.usgs.gov/dds/dds-43/.

A research report by Omi and Martinson (2002) (Exhibit J) found that "[e]vidence of fuel treatment efficacy for reducing wildfire damages is largely restricted to anecdotal observations and simulations." In fact, there is scientific evidence that thinning can make the fuel hazard worse instead of better. Graham et al. (2004) noted that "[d]etailed site-specific data on anything beyond basic forest structure and fuel properties are rare, limiting our analytical capability to prescribe management actions to achieve desired conditions for altering fuels and fire hazard." Further, thinning can alter the heating of the understory and subsequently reduce moisture levels:

> Thinning opens stands to greater solar radiation and wind movement, resulting in warmer temperatures and drier fuels throughout the fire season.
>
> [T]his openness can encourage a surface fire to spread…Opening up closed forests through selective logging can accelerate the spread of fire through them because a physical principle of combustion is that reducing the bulk density of potential fuel increases the velocity of the combustion reaction. Wind can flow more rapidly through the flaming zone. Thinned stands have more sun exposure in the understory, and a warmer microclimate, which facilitates fire (Countryman 1955) …
>
> [F]uel reduction activities – particularly mechanized treatments – inevitably function to disturb soils and promote the invasion and establishment of non-native species. Pile burned areas associated with the treatments are also prone to invasion (Korb et al. 2004). Annual grasses can invade treated areas if light levels are high enough, leading to

> increased likelihood of ignition, and more rapid spread of fire, which can further favor annual grasses (Mack and D 'Antonio 1998). This type of feedback loop following the establishment of non-native plants may result in an altered fire regime for an impacted region, requiring extensive (and expensive) remedial action by land managers (Brooks et al. 2004).

Odion (2004).

The authors of a study that analyzed fires in thinned and unthinned areas in Sierra Nevada forests noted: "Thinned areas predominantly burned at high severity, while unthinned areas burned predominantly at low and moderate severity…. [C]ombined mortality was higher in thinned than in unthinned units." Hanson and Odion 2006 (Exhibit K).

Hanson and Odion (2006) went on to suggest that mechanical thinning may have "effectively lowered the fire weather threshold necessary for high severity fire occurrence." Furthermore, researchers with the U.S. Forest Service acknowledge the potential for thinning to create more intense conditions for surface fire spread:

> Theoretically, fuel treatments have the potential to exacerbate fire behavior. Crown fuel reduction exposes surface fuels to increased solar radiation, which would be expected to lower fuel moisture content and promote production of fine herbaceous fuels. Surface fuels may also be exposed to intensified wind fields, accelerating both desiccation and heat transfer.
>
> Treatments that include prescribed burning will increase nutrient availability and further stimulate production of fuels with high surface-area- to-volume ratios. All these factors facilitate the combustion process, increase rates of heat release, and intensify surface fire behavior….
>
> Thus, treatments that reduce canopy fuels increase and decrease fire hazard simultaneously. With little empirical evidence and an infant crown fire theory, fuel treatment practitioners have gambled that a reduction in crown fuels outweighs any increase in surface fire hazard….

Omi and Martinson 2002 (Exhibit J).

A recent study also found that protected forests (those with more restrictions on logging activities such as those in the Proposed Action) had lower fire severity levels over a 30-year period (and across 1,500 fires), but they actually had *lower* fire severity levels despite being identified as having increased biomass and fuel loading compared to less-protected forests with more logging activities. Bradley et al. 2016 (Exhibit L).

The project analysis must disclose the scientific uncertainty and controversy surrounding fuel reduction and fire behavior and should recognize that vegetation treatments can increase fine fuel loads while removing the large, fire-resilient logs that are relatively less prone to burn.

11. The Forest Service must prepare an Environmental Impact Statement (EIS) because the proposal is likely to have significant impacts.

The Forest Service must prepare and EIS because it implicates several of NEPA's intensity factors, including effects on endangered SSN fishers, sensitive California spotted owls and northern goshawks, inventoried roadless areas, public safety, the highly controversial nature of the proposal, and it would set a precedent for this type of post-fire proposal in the GSNM. Together, these factors suggest that the proposed actions will cause significant effects on the environment, requiring preparation of an EIS.

Moreover, there will be substantial cumulative effects in combination with the overlapping SQF Complex/Castle Fire Roadside hazard tree project, which would log an area of roughly 9,450 acres. Our comments on that proposal and our detailed concerns are attached as Exhibit H.

The size of the proposed actions and the likely large number of trees proposed to be removed from the project area are on a similar scale as the largest timber sale operations implemented on the Sequoia National Forest in decades. Hence, the project likely constitutes a major federal action that would require analysis in an Environmental Impact Statement (EIS).

The Castle Fire itself had an effect (negative, and in some areas positive or neutral) on the endangered Pacific fisher population in the project area. The fire and the proposed action (and any action alternatives) are likely to have significant direct, indirect, and cumulative effects on the fisher population, as well as the fisher's ability to disperse or move through a fragmented fire and project area.

In circumstances similar to the Castle Fire, the Forest Service found that the combination of the Rancheria Project and the Cedar Fire in the Greenhorn Mountains of the Sequoia National Forest may constitute significant effects acknowledging that it needed to supplement its NEPA analysis. In its Supplemental Information Report (SIR), the Forest Supervisor found that "the habitat fragmentation and loss of connectivity caused by the Cedar Fire occurred after the 2013 Fisher BE was completed. These changes may be significant and alter the original determination for this project that the Rancheria Project 'may affect individuals, but is not likely to contribute to the need for Federal listing or result in loss of viability of fisher…. Therefore, in accordance with FSH 1909.15 Section 18.4, it is my determination that supplemental NEPA analysis must be prepared ….' " SIR, p. 12 (Exhibit I, attached).

The Forest Service has recognized the significance of fragmentation and loss of connectivity caused by a fire in combination with the Rancheria logging project, which was actually smaller than the current proposal when combined with the 9,450 acres of roadside hazard activities proposed within the Castle Fire area.

The proposal is highly controversial, scientifically, because, as discussed above, the area is likely to recover naturally and does not need human intervention with actions associated with replanting. *See* Hanson & Chi (2021) (Exhibit D).

Moreover, the proposed fuel reduction treatments in WUI defense zones are highly controversial, scientifically, as discuss above, and likely to adversely affect public safety and increase rather than reduce fuels and associated wildfire risk.

12. The EIS must analyze the greenhouse gas (GHG) emissions generated by the proposal and their effects on climate change.

The proposal would likely remove thousands of trees as sawtimber, by burning on site, as firewood, and as biomass, which would not only release thousands of tons of GHGs into the atmosphere over a very short period of time, but would also irrevocably consume the limited natural resource of petroleum products in order to transport the biomass to a burning facility and would emit additional GHGs at those facilities. Leaving the material in the forest to naturally decay would significantly reduce the pulse of GHGs and store much of the carbon in the soil in comparison to the proposal to fell and remove trees. Moreover, the Forest Service, other public agencies, and private entities continue to implement similar large-scale biomass and other burning activities throughout the mountains of the Sierra Nevada and other national forests as a result of similar proposals. In combination, these activities will likely release cumulatively more GHGs into the atmosphere over a very short period of time thus exacerbating effects on climate change. These cumulative additions of GHG emissions and their effects on climate change must be considered and analyzed.

Consideration of climate change and GHG emissions are required by the Forest Service's Washington Office. *See* https://www.fs.usda.gov/ccrc/topics/introduction-incorporating-climate-change-nepa-process.

Each alternative should discuss and analyze carbon and methane emissions from implementation of the proposed action and the equipment used to implement the proposed action, and the no-action alternative should also provide information about the potential for carbon sequestration in area soils (and the reduced rate of GHG emissions from natural decay) from foregoing project implementation that would remove or burn trees.

The environmental analysis must disclose the emissions from biomass and on-site burning, as well as the GHG emissions caused by equipment and transportation, for each action alternative. For this, the Chief's office of the Forest Service has generated specific direction on how to discuss climate change effects in a NEPA analysis. *See* Climate Change Considerations in Project Level NEPA Analysis (Jan. 13, 2009) (attached as Attachment E). That document includes how similar projects should disclose direct effects on climate change:

- **The effect of a proposed project on climate change** (GHG emissions and carbon cycling). Examples include: short-term GHG emissions and alteration to the carbon cycle caused by hazardous fuels reduction projects, GHG emissions from oil and gas field development, and avoiding large GHG emissions pulses and effects to the carbon cycle by thinning overstocked stands to increase forest resilience and decrease the potential for large scale wildfire.

*Id.* at 2. To assist in disclosing these effects, the Forest Service provides tools that can help managers determine the direct contributions of GHG emissions from project burning or treatments. *Id.* at 5 (*FOFEM 5.5, Consume 3.0,* and the *Forest Vegetation Simulator*). Because the Forest Service has tools or models to effectively calculate emissions, it must disclose these emissions for each of the action alternatives. In addition, the guidance document suggests that the NEPA document include a qualitative effects analysis. *Id.* Such an analysis should include the cumulative effects, quantified in an "individual, regional, national, global" context. *Id.* at 6.

Finally, the guidance suggests that NEPA provides direction on how managers should respond to comments raised during project analysis regarding climate change:

1. Modify alternatives including the proposed action.
2. Develop and evaluate alternatives not previously given serious consideration by the Agency.
3. Supplement, improve, or modify the analysis.
4. Make factual corrections.
5. Explain why the comments do not warrant further agency response, citing the sources, authorities, or reasons which support the Agency's position and, if appropriate, indicate those circumstances that would trigger agency reappraisal or further response.

*Id.* at 8. At the very least, because this project includes tree removal and burning that will contribute GHG emissions, the EA must include an acknowledgment of carbon emissions and must provide a response to this issue.

Moreover, the analysis should account for and quantify (as part of the cumulative effects analysis) not only the emission from burning on-site and the emissions from any biomass that is removed from the project area and later burned off-site, but also the contribution of emissions from transporting this material for off-site burning, and the contribution of emissions from planning and implementing the project by contractors and by the Forest Service.

This holistic approach to account for GHG emission is necessary to provide managers and the public with the kind of information under NEPA to make informed choices between alternatives, to mitigate actions to that may affect climate change, and to consider and assess the larger picture of GHG contributions from all national forest projects that may contribute GHG emissions.

Finally, if the Southwest Regional Office has or is planning to conduct additional analysis on the effects from the cumulative treatments from similar projects in the Southern Sierras, the analysis should reference and disclose that information.

In addition, the use of fossil fuels to cut, load, and haul trees and other woody vegetation from the forest to the sawmill or energy generation facilities sacrifices more to climate change and contributes to the extremely polluted air of the San Joaquin Valley and southern Sierra Nevada. The lack of clean air has caused permanent lung damage to many residents exacerbating the deadly consequences of the Covid-19 pandemic. Fossil fuel use to haul personnel to and from

the forest to perform the proposed ground disturbing activities will further intensify the global climate crisis.

For Sequoia ForestKeeper and the Kern-Kaweah Chapter of the Sierra Club,

Sincerely,

René Voss – Attorney at Law