JOHN MUIR
PROJECT

28 February 2026

David Fournier, Forest Supervisor
Eldorado National Forest
100 Forni Rd.
Placerville, CA 95667
Attn: MAC Project

RE: Mokelumne Amador Calaveras Forest Health and Resilience Project Draft EIS

Dear Forest Supervisor Fournier and Forest Supervisor Kuiken,

On behalf of the John Muir Project of Earth Island Institute (JMP), we are submitting these comments in opposition to the MAC Project Draft EIS (DEIS). Based on the following, this proposal should simply be withdrawn.

<u>2004 Sierra Nevada Forest Plan Amendment is Outdated and Invalid under NEPA</u>

The proposed project is invalid under NEPA because the 2004 Framework forest plan itself, upon which the proposal is predicted, is invalid and outdated under NEPA, due to significant new information and changed circumstances. The 2004 Framework assumed, based on information available at that time, that (a) denser forests will consistently burn more severely in wildfires, (b) thinning is necessary prior to conducting prescribed fire or managed wildfire, (c) thinning and post-fire logging will reliably curb wildfires and protect communities, (d) California spotted owls are categorically harmed by higher-severity wildfire patches, (e) mechanical thinning, conducted under the standards and guidelines of the 2004 Framework, will not harm spotted owls and will not lead to a trend toward listing under the Endangered Species Act, and (f) post-fire logging does not impact spotted owls ostensibly because it focuses on removing patches of forest where most or all trees have been killed (higher-severity fire patches). All of these core assumptions of the 2004 Framework have been strongly and repeatedly refuted and questioned by subsequent research, much of which has been published by Forest Service scientists, as discussed in detail below.

Significant New Information: The Biological Status of the California Spotted Owl Has Changed and the USFWS Has Found that the Minimalist Protections in the 2004 Sierra Nevada Framework Forest Plan are No Longer Adequate to Prevent the Owl from Being Driven to Extinction

Decades ago, the U.S. Fish and Wildlife Service (USFWS) rejected previous petitions to list the California spotted owl under the ESA. Back then, USFWS found that the population status of the owl was too unclear, and the threats were too uncertain, to warrant ESA listing. At that time, USFWS believed that the provisions in the 2004 Sierra Nevada Framework Forest Plan, designed to mitigate impacts of logging (including mechanical thinning) on spotted owls, would be adequate to prevent a declining trend toward extinction and the need for ESA listing. USFWS has now, for the first time ever, determined that the California spotted owl's biological status has changed, that the owl's populations are clearly declining and continue to decline, that the 2004 Framework Forest Plan's provisions are not adequate to prevent the owl from being driven to extinction, and that ESA listing is now necessary, biologically, to prevent the extinction of the California spotted owl, based on new scientific information (USFWS 2023). Mechanical thinning, post-fire logging, and other logging are described as threats to the spotted owl (USFWS 2023).

Current research confirms severe adverse impacts to spotted owls from mechanical thinning (Stephens et al. 2014, Gallagher et al. 2019) and post-fire logging, and neutral or positive effects from big wildfires in the absence of post-fire logging (Hanson et al. 2018, Lee 2020, Hanson et al. 2021). The U.S. Fish and Wildlife Service (USFWS 2023) recently proposed **(see attached 60-day comments on the proposed listing, which we incorporate herein by reference)** to list the California spotted owl as threatened in the Sierra Nevada, and noted that mechanical thinning has an adverse impact on the owls. A Supplemental EIS (SEIS) must be prepared to analyze to spotted owls under the 2004 Framework, and logging of spotted owl nesting, roosting, and foraging habitat, and logging within the biological homes ranges of spotted owls, must be halted until an SEIS is completed.

High-intensity fire patches are highly suitable foraging habitat for spotted owls, so long as they are not subjected to post-fire logging (e.g., Lee 2020, Hanson et al. 2021, USFS 2023). In contrast, mechanical thinning in the northern Sierra Nevada has been found to reduce California spotted owl occupancy by 43% (Stephens et al. 2014), and post-fire logging is associated with even large population declines (Hanson et al. 2018, 2021). Gallagher (2010) and Gallagher et al. (2019) found that spotted owls tend to avoid areas where mechanical thinning has occurred.

Jones et al. (2020) admits that California spotted owls actively forage in high-intensity fire areas, but claiming that they "rarely" do so farther than 100 meters into high-intensity fire areas. Jones et al. (2020) found: "Spotted owls avoided areas that had experienced post-fire salvage logging". Kramer et al. (2021) has been cited for the proposition that spotted owls forage less deeper into the interior of larger high-intensity fire patches. However, neither that study nor Jones et al. (2020) took into account the fact that spotted owls nest in lower-intensity fire areas, and forage less as they get farther and farther away from the nest site, regardless of whether such more distant areas are in high-intensity fire patch interiors or in dense, old forest, as found in Bond et al. (2009) and as explained in Hanson et al. (2021). Thus, the Jones et al. (2020) and Kramer et al. (2021) studies are misleading because they do not account for distance from the nest site. Spotted owls also forage less into the interior of dense, old forests as distance increases from nest sites. Only Bond et al. (2009) accounted for distance from nest sites and they found that spotted owls preferentially select high-intensity fire areas up to 1500 meters away from nest sites, including in areas much more than 100 meters into the interiors of high-intensity fire patches. Bond et al. (2009), Hanson et al. (2018), and Hanson et al. (2021) find that mature/old forest that experienced high-intensity fire, and becomes complex early seral forest habitat ("snag forest habitat") is suitable spotted owl habitat, specifically suitable foraging habitat.

The US Fish and Wildlife Service's proposal to list the California spotted owl under the Endangered Species Act acknowledges serious harm to spotted owls from mechanical thinning and post-fire logging. For example:

On p. 62 of the USFWS listing proposal, USFWS admits that "mechanical thinning can decrease California spotted owl occupancy and is negatively correlated with reproduction (Tempel et al. 2014a, p. 2089; Stephens et al. 2014, p. 903; Tempel et al. 2022, p. 19)", and further concludes on p. 62 that "there is evidence of reduced foraging in fuel treatment areas" and "Thinning may have negative short-term effects on prey species by increasing the risk of predation by removing above-ground cover and reducing canopy connectivity, and thinning may remove suitable nesting substrates…"

On p. 63, USFWS admits that "California spotted owls inhabit areas of low-medium severity fire, patchy high-severity fire, and areas with dead trees; therefore, salvage logging likely reduces the amount of habitat available for California spotted owls (Gutiérrez et al. 2017, p. 276)." USFWS further admits, on p. 63, that there is evidence that "California spotted owl occupancy decreases with salvage logging (Lee et al. 2013, p. 1327; Lee and Bond 2015, p. 228; Hanson and Chi 2021, p. 5)", and that "Salvage logging can be a threat to California spotted owls when their habitat components of large trees, coarse woody debris, and habitat heterogeneity are removed from the landscape, resulting in a decrease in occupancy at the population level." USFWS also admits, at the top of p. 64, that the Sierra Nevada Forest Plan Amendment even allows salvage logging in California spotted owl PACs that are occupied by spotted owls after fires, so long as the Forest Service merely claims that the territory is no longer suitable for spotted owls postfire, which the agency can do under the 2004 Framework even if spotted owls are nesting and reproducing (Lee and Bond 2015, Hanson et al. 2018).

Significant New Information: Even the Inadequate Protections for Spotted Owls in the 2004 Framework Are Not Being Followed by the Forest Service Now

Even the minimal and insufficient protections for spotted owls in the 2004 Framework are not being sidestepped and circumvented by the Forest Service.

The proposed action would implement approximately 90,000 acres of logging through mechanical thinning (approximately 67,000 acres of "forest thinning" and approximately 23,000 acres of "fuelbreaks" that the DEIS states is essentially the same as the "forest thinning"), and that "average" canopy cover in these areas after logging would be as little as 30% (with a range of 30% to 50%). The DEIS, at page 156, defines "highest-quality nesting and roosting habitat" for spotted owls as mature/old forest with 60-100% canopy cover. Tables 1 and 7 of the DEIS state that this includes 29,804 acres of logging through mechanical thinning in the core of spotted owl territories, i.e., the PAC plus the "territory" outside of the PAC. Notably, USFWS (2023) makes clear that spotted owl biological homes ranges—the areas that they actually use for the habitat they need to survive—are much larger than the PAC plus "territory" as defined by the DEIS. Thus, the PAC plus "territory" must be viewed as the core of spotted owl biological homes ranges, not the entirety. Table 15 of the DEIS states that an *additional* 49,418 acres of suitable spotted owl habitat outside of the PAC/territory areas (i.e., in the remainder of biological home ranges) would be logged in addition to the 29,804 acres that would be logged in designated PACs/territories. Table 16 of the DEIS states that the project would result in the loss of 37,071 acres of suitable spotted owl habitat. This does not include additional acreages of degradation of high quality spotted owl habitat to barely suitable habitat. Table 20 of the DEIS shows that 124 spotted owl territories would be impacted by this logging project.

The proposed action would implement a project-specific amendment of the standards and guidelines in the 2004 Framework that were designed to protect California spotted owls and prevent a trend toward ESA listing—the same standards and guidelines that USFWS just found to be inadequate to protect and maintain spotted owl populations. These project-specific amendments to the 2004 Framework, listed in Appendix C of the DEIS, include: a) allowing a re-drawing of the boundaries of spotted owl nest cores (PACs) in order to allow logging—mechanical thinning—in PACs; b) shortening the limited operating period to allow helicopter logging flights over PACs during nesting season; c) changing the normal limited operating period from mandatory to optional, and allowing Forest Service staff to waive limited operating periods in order to allow logging in or adjacent to PACs during nesting season; d) elimination of the Framework's requirement to maintain suitable spotted owl in 700-acre Home Range Core Areas

(HRCAs) surrounding the 300-acre PACs, and allowing the Forest Service to maintain only 40% suitable habitat in each 1000-acre spotted owl "territory", i.e., 60% unsuitable habitat in each territory; e) eliminating the requirement to maintain at least 50% forest canopy cover in HRCAs, and instead only requiring that some "clumps" and "areas" of high canopy cover be retained; f) logging of mature/old-growth trees up to 35 inches in diameter in spotted owl territories whenever the Forest Service claims it is necessary to "equipment operability"; g) completely eliminating the Framework requirement to "Avoid PACs to the greatest extent possible" when planning mechanical thinning and other logging projects.

Elsewhere in the Sierra Nevada, similarly huge logging projects, with project-specific forest plan amendments to allow even more intensive and expansive logging in California spotted owl habitat are being implemented. For example, in the Community Protection – Central and West Slope Project on the Plumas National Forest (USFS 2025a), highly similar project-specific amendments to the Framework are being implemented to allow much more intensive mechanical thinning in spotted owl habitat. This project would affect 218,000 acres, mostly mature/old forest inhabited by spotted owls, and would impact 98 California spotted owl territories. The North Fork Project on the Plumas National Forest would impact 167,000 acres, and also involves similar project-specific amendments to the 2004 Framework to allow even more intensive logging in spotted owl habitat (USFS 2025b). The North Fork EA does not divulge how many spotted owl territories would be impacted but Table 44 of the EA indicates that about 42,000 acres of suitable spotted owl habitat would be affected. The Tributaries Project on the Plumas National Forest would affect 163,000 acres, including about 20,000 acres of suitable spotted owl habitat, according to Table 5 of the EA (USFS 2025c). The number of spotted owl territories impacted is not divulged in that EA.

In the MAC DEIS, and in the EAs for each of the similarly huge logging projects in spotted owl habitat mentioned above, the Forest Service makes a determination that the planned logging may affect spotted owls and their populations but will not jeopardize their populations or cause a trend toward the need for ESA listing. In addition to violating NEPA by failing to prepare a Supplemental EIS to update the 2004 Framework, the Forest Service is also violating NEPA by failing to prepare a range-wide EIS to fully consider and analyze the impacts, including cumulative effects, of all of these logging projects, and project-specific forest plan amendments, on spotted owl populations and population viability. The DEIS and the EAs reference a 2019 California spotted owl Conservation Strategy from the U.S. Forest Service. However, that document has not been vetted through NEPA and cannot be used as a way to circumvent the law. More importantly, USFWS (2023) already determined that all of the Forest Service's current management direction in spotted owl habitat is inadequate and insufficient to maintain California spotted owl populations, that current Forest Service forest management is already jeopardizing spotted owl populations, and that the California spotted owl is already, currently, on a trend toward extinction, and needs to be listed under the ESA. Given this, the determination in the

MAC DEIS, and documents for other large logging projects in spotted owl habitat, claiming that these projects will not jeopardize California spotted owl populations, or cause a trend toward a need to list the species under the ESA, is arbitrary and capricious on its face.

The MAC DEIS, and the MAC Wildlife Biological Evaluation (BE), improperly attempt to downplay the impacts to spotted owls from this logging project. For example, the BE, on page 103, cites to Ng. et al. (2025) for the proposition that high-severity fire is by far the biggest threat to California spotted owls, and states that spotted owl occupancy is “less likely” where mechanical thinning has reduced canopy cover by more than 25% (Ng et al. 2025 call this “heavier” fuel reduction), but downplays this by suggesting that the negative effects of mechanical thinning on spotted owls are “small”. This page of the BE also claims, based on Ng et al. (2025), that spotted owls are “insensitive” to mechanical thinning that reduces canopy cover by less than 25% (Ng et al. 2025 call this “lighter” fuel reduction), implying that mechanical thinning that reduces canopy cover by less than 25% does not have any negative effect on spotted owls. This key passage from the BE is wildly misleading in several ways, and improperly downplays the adverse impacts of mechanical thinning on spotted owls.

First, Ng et al. (2025) explicitly stated that their conclusion that high-severity fire has been a bigger threat to spotted owl populations than mechanical thinning is based on the fact that there have been far more acres of wildfire than mechanical thinning in recent years. Notably, with project like MAC and the similarly large Plumas National Forest mechanical thinning projects discussed above, the Forest Service is clearly attempting to dramatically increase the rate of mechanical thinning, which would increase the threat of mechanical thinning to spotted owls relative to the claimed threat of wildfire.

Second, while the BE claims that mechanical thinning which reduces canopy cover by 25% or more merely makes it “less likely” for spotted owls to use thinned areas, the BE neglects to divulge that Figure 4c of Ng et al. (2025) shows that, when “heavier” mechanical thinning (mechanical thinning that reduces canopy cover by 25% or more) is conducted on about one-quarter of a California spotted owl territory, this reduces the probability of territory occupancy by spotted owls to only about 20% (i.e., about 80% probability of non-occupancy). This means that, when the canopy cover reduction from mechanical thinning is *averaged* across 100% of a given spotted owl territory, as the MAC DEIS does (in Tables 18 and 20), the reduction in canopy cover of this scenario (25% canopy cover reduction across 25% of a territory) equates to an *average* of just over 8% canopy cover reduction across the whole territory. This is vitally important because the figures in MAC DEIS Table 18 pertaining to the *average* percent canopy cover reduction across the entirety of the 124 spotted owl territories in the Project areas are mostly 8% and *higher*. Several dozen spotted owl territories would have an average canopy cover reduction of 10% to 15% or higher, which equates to a 25% canopy cover reduction across about one-third to one-half of these spotted owl territories—a level of canopy cover reduction that equates to a massive loss of occupancy (only 10-15% probability of occupancy, or, stated differently, an 85-90% probability of non-occupancy) according to Figure 4c of Ng et al. (2025).

Third, Ng et al. (2025) did not account for the impact and confounding influence of post-fire logging, which is conducted almost exclusively in high-severity fire areas on national forests. Ng et al. (2025), in their Discussion section, assume that the amount of post-fire logging on public lands is "generally relatively small", providing no data or analysis whatsoever to support this assumption. It is unclear what the authors meant by "generally relatively small". Importantly, research has found that spotted owl occupancy was reduced by about two-thirds by post-fire logging averaging only 16.7% of spotted owl territories (Hanson et al. 2018, Hanson et al. 2021). Curiously, Ng et al. (2025) did not cite or mention this research. Ng et al. (2025), in the Discussion, also references 9 studies that they claim show that high-severity fire is a major threat to spotted owl populations but, like Ng et al. (2025) itself, these studies did not account for post-fire logging and were, therefore, confounded by post-fire logging. Where research has accounted for post-fire logging, and has analyzed the effects of high-severity fire alone on spotted owls (without the influence of post-fire logging), no adverse impact on occupancy has been found (Lee 2018, Hanson et al. 2018, Lee 2020, Hanson et al. 2021).

Fourth, Ng et al. (2025)'s results regarding "lighter fuel reduction" must be understood in context. Ng et al. (2025) included, as "fuel reduction", not only mechanical thinning but also prescribed fire, pruning, and removal of combustible invasive weeds. It is well established that spotted owls are not adversely impacted by fire alone, which cannot be equated with mechanical thinning. When fire reduces canopy cover, it is because some live trees have become snags, which are vitally important to spotted owls and their prey, whereas mechanical thinning creates stumps, which are of no value to spotted owls or their prey. Prescribed fire, without thinning, has become a much more common forest management activity in recent decades. It is likely that much of the "lighter fuel reduction" category was comprised by prescribed fire, and other activities that are not mechanical thinning. We know from other research that mechanical thinning that reduces canopy cover by less than 25% nevertheless causes serious adverse impacts to spotted owls (e.g., Gallagher 2010, Stephens et al. 2014, Gallagher et al. 2019).

In light of the foregoing, the comment by the Forest Service-funded scientists in Ng et al. (2025), claiming that high-severity fire is the main threat to spotted owls, attempting to downplay the impacts of thinning, and opining that the "matter is settled", must be viewed as a political statement, not a scientific one.

Significant New Information: Historical Forest Density Was Much Higher than Previously Assumed, at the time of the 2004 Framework, in California Spotted Owl Habitat, and Historical Fire Severity Was Much More Mixed Historically Than Previously Assumed

The 2004 Framework repeatedly articulates the assumption that historical forests were very open, with relatively low tree densities, and had little or no high-severity/high-intensity fire, and uses this assumption to justify landscape-scale logging in spotted owl habitat under the rubric of restoration.

However, more recent scientific information, analyzing historical documents, has found that historical Sierra Nevada forests in spotted owl habitat were far more dense than previously claimed/assumed, and high-severity fire was a significant component, and included both small and large high-severity fire patches (Baker 2014, Odion et al. 2014, Odion et al. 2016, Stevens et al. 2016, Hanson and Odion 2016a, Hanson and Odion 2016b, Baker and Hanson 2017, Baker et al. 2018, Baker and Williams 2019, Baker et al. 2023). For example, Baker et al. (2018) found that Forest Service studies had omitted most of the historical forest density data, including historical data on very dense forests. When all of the historical forest density data were included, it was found that, in terms of trees per acre, historical mixed-conifer forests were 7 times denser than the Forest Service claimed, and historical ponderosa pine forests were 17 times denser (Baker et al. 2018). These findings are uncontested in the peer-reviewed scientific literature. Instead of attempting to rebut these findings, which the Forest Service could not do, the Forest Service scientists published a series of papers that discussed response articles that Forest Service scientists had published in reaction to various studies by independent scientists who found much denser historical Sierra Nevada forests, and much more historical high-severity fire, than the Forest Service wanted to admit. However, this series of Forest Service papers omitted any mention of (a) the fact that the Forest Service response articles did not challenge or contest the fundamental findings of the studies to which they were responding, and (b) the many published *reply* articles that soundly refuted the Forest Service response articles. This glaring omission created the false impression that the Forest Service's response articles were the last word on the subject, a pattern of omissions that caused a "falsification of the scientific record", according to a comprehensive analysis by Baker et al. (2023).

Baker et al. (2023) remains uncontested in the peer-reviewed scientific literature, and Forest Service-funded scientists have not denied that they engaged in the pervasive pattern of scientific omissions that Baker et al. (2023) meticulously documents. Instead, some Forest Service scientists, and some university scientists who are funded by the Forest Service, have attempted to dismiss and attack Baker et al. (2023) outside of the scientific process, by engaging in a series of baseless and unprofessional personal attacks against the authors of Baker et al. (2023), and by making false attacks on the scientific publishing house (MDPI) and scientific journal (*Fire*) that published Baker et al. (2023). Specifically, these Forest Service scientists have falsely claimed that a science watchdog entity, Cabell's Predatory Reports, has classified MDPI, and the journal *Fire*, as illegitimate scientific entities. However, the websites that the Forest Service scientists have referenced for their attacks on the journal *Fire* and MDPI do not pertain to Cabell's Predatory Reports but, rather, pertain to an imposter organization, calling itself "Predatory Reports", which is a criminal enterprise that attempts to extort money from science publishers and journals, threatening to defame and attack them if they do not pay up. Both Cabell's Predatory Reports and MDPI have published articles exposing this criminal enterprise: https://www.mdpi.com/about/announcements/5482

https://blog.cabells.com/2024/01/16/unmasking-a-predator-predatoryreports-org/

It is shameful that some Forest Service-funded scientists would stoop to such personal attacks and reliance on wildly discredited entities. Notably, Forest Service scientists frequently publish studies in MDPI journals, and have done so for years.

Significant New Information: Unmanaged Forests Are Not More Likely to Burn Than Managed, Roaded Forests

A three-decade analysis of wildfires found that fires are 2 to 4 times more likely to occur in roaded areas (generally, the managed forest landscape) than in Roadless Areas (Aplet et al. 2025, in review: https://www.wilderness.org/sites/default/files/media/file/Summary%20NFS%20roads%20fire%20paper%20-%202025.pdf). Other research has found that 90% of all wildfires occur within half a mile of a road, and there is a highly significant correlation between proximity to roads and increased wildfire occurrence (Morrison 2007: https://www.pacificbio.org/publications/wildfire_studies/Roads_And_Wildfires_2007.pdf).

Significant New Information: Unmanaged Forests Do Not Burn More Intensely than Managed, Roaded Forests

An enormous study of 1500 wildfires across the entire western U.S., which analyzed three decades of wildfire data, specifically compared protected forests (forests with no logging) to roaded, managed forests in the very same forest types, for a close comparison, and found that managed, roaded forests had higher wildfire severity (Bradley et al. 2016: https://esajournals.onlinelibrary.wiley.com/doi/10.1002/ecs2.1492). Another large study, also analyzing three decades of wildfire data in Roadless Areas and roaded forests, found that "there was no significant difference in fire severity between roadless areas and roaded areas after accounting for biophysical differences" (Johnston et al. 2021: https://iopscience.iop.org/article/10.1088/1748-9326/ac13ee). Johnston et al. (2021) concluded that “management regime had no influence on fire severity in any of the statistical models”. In other words, the road building and logging in the managed forest landscape did not reduce wildfire severity. Johnston et al. (2021) further found that a larger proportion of Roadless Areas experienced wildfire over the three decade study period in significant part because “large remote landscapes allow managers flexibility to allow fires to burn when these fires are compatible with resource management objectives”, and because fire suppression forces naturally focus efforts near homes, which tend to be surrounded by or adjacent to managed, roaded forests. The authors concluded that land managers’ practice of allowing more fires to occur in Roadless Areas without trying to suppress them “may confer resilience to these landscapes in the face of climate change.”

Significant New Information: Mechanical Thinning Increases Overall Tree Mortality

The 2004 Framework assumed that mechanical thinning, while removing some trees, would on balance save more forest and trees from wildfires and bark beetles. New scientific information has found this assumption to be false.

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.

> **Thinning followed by burning increases overall fire severity.**
>
> “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)

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.

Thinning followed by burning increases overall fire severity.

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.

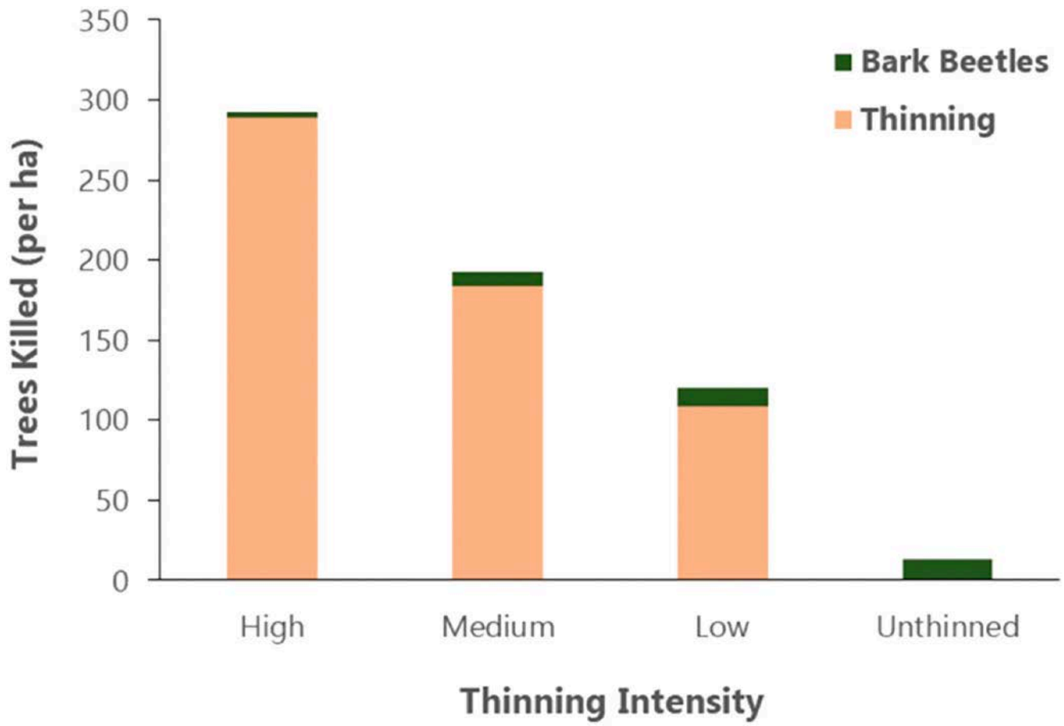
DellaSala et al. (2022, Section 5.2) also reviewed several U.S. Forest Service studies relied upon by Prichard et al. (2021) for the claim that commercial thinning is an effective fire management approach and found that the actual results of these cited studies did not support that conclusion.

Hanson, C.T. 2025. Correction: Hanson, C.T. Cumulative Severity of Thinned and Unthinned Forests in a Large California Wildfire. *Land* 2022, *11*, 373. Land **14**: Article 1489.

Mechanical thinning, including thinning plus burning, killed significantly more trees than it prevented from being killed.

Lindenmayer, D., P. Zylstra, C. Hanson, D. Six, and D. DellaSala. 2025. When Active Management of high conservation value forests may erode biodiversity and damage ecosystems. Biological Conservation **305**: Article 111071.

Mechanical thinning, conducted ostensibly to reduce tree mortality from drought and bark beetles, kills vastly more trees than it prevents from being killed (see Figure 2 of Lindenmayer et al. 2025, reproduced below).



Lindenmayer, D.L., D.A. DellaSala, E. Bowd, B.E. Law, P.J. Burton, C.T. Hanson, P. Zylstra, and W.J. Ripple. 2026. Ecological trade-offs of mechanical thinning in temperate forests. *Biological Conservation* **316**: Article 111748.

> The ecological and financial costs of mechanical thinning and other logging, conducted ostensibly as fuel reduction, vastly outweigh any perceived or claimed benefits, including with regard to wildfire management.

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."

<u>Significant New Information: Mechanical Thinning and Post-fire Logging in Forest Wildlands Do Not Protect Communities from Wildfires; Instead, Such Logging Increases Wildfire Threats to Communities and is Associated with Large-Scale Losses of Homes and Lives to Fires Recently</u>

The 2004 Framework assumed that mechanical thinning, post-fire logging, and other logging activities in forest wildlands, distant from homes, would stop wildfires from reaching communities, or at least would curb wildfires to such an extent, greatly reducing their intensity and slowing them, that fire suppression forces would be able to reliably suppress the fires before they reached towns. The 2004 Framework established "Defense" and "Threat" zones, together extending 1.5 miles away from the nearest homes, allowing intensive mechanical thinning and other logging in these extremely broad zones ostensibly to protect communities from wildfires. Subsequent science, including many studies by Forest Service scientists, and evidence from real-world recent examples, have shown these assumptions to be incorrect, counter-productive, and dangerous.

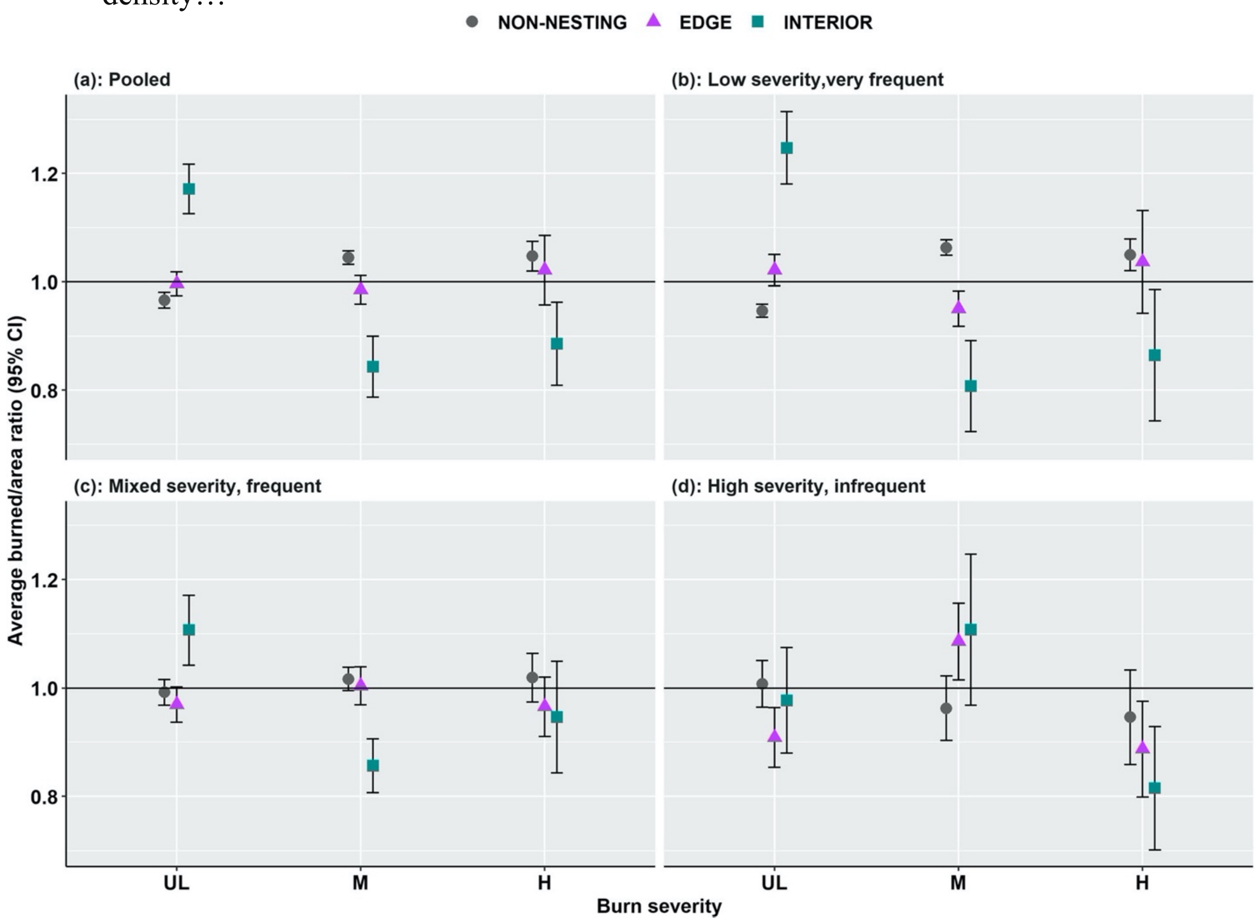
Mechanical thinning, post-fire logging, and other logging activities are likely to increase, not decrease, the threats of wildfire to communities for three main reasons. First, thinning and other tree removal activities reduces the windbreak effect that denser forests have, and causes winds to move much faster through forests, which increases the speed of wildfires, giving communities less time to safely evacuate and first responders less time to arrive and help. A comprehensive recent study by Balch et al. (2024: https://www.science.org/doi/10.1126/science.adk5737) found that higher speed is the main factor associated with large losses of homes and lives in wildfires. Balch et al. (2024) noted that wildfires spread much faster through less dense vegetation with "low wind friction". Second, when land managers conduct thinning, post-fire logging, and other logging projects out in wildlands, distant from homes, and tell communities that such logging will stop wildfires from reaching homes, this can give communities a dangerous false sense of security, which can reduce motivation to conduct proven, highly effective community fire safety activities, such as home hardening, defensible space pruning, and evacuation planning. By focusing on forest and chaparral wildlands, instead of on the communities themselves, land managers put communities at greater risk, as the Forest Service's own scientists recently concluded in Calkin et al. (2023: https://www.pnas.org/doi/10.1073/pnas.2315797120). Third, this proposal to allow rampant logging, including mechanical thinning and post-fire logging, ostensibly to curb wildfires and protect communities, ignores the fact that a large body of science from the U.S. Forest Service's own scientists finds that mechanical thinning and post-fire logging actually increase wildfire severity. Below are citations to a number of ***sources from the Forest Service itself*** finding that mechanical thinning or post-fire logging increases fire severity, denser forests burn less intensely, and that the only zone relevant to protecting communities from fire is the defensible space zone within about 100 feet or less around each home or other human structure:

Lesmeister, D.B., et al. 2019. Mixed-severity wildfire and habitat of an old-forest obligate. Ecosphere10: Article e02696.

> "Thinned forests have more open conditions, which are associated with higher temperatures, lower relative humidity, higher wind speeds, and increasing fire intensity. Furthermore, live and dead fuels in young forest or thinned stands with dense saplings or shrub understory will be drier, making ignition and high heat more likely, and the rate of spread higher because of the relative lack of wind breaks provided by closed canopies with large trees."

Lesmeister, D.B., et al. 2021. Northern spotted owl nesting forests as fire refugia: a 30-year synthesis of large wildfires. Fire Ecology 17: Article 32.

> Lower-density forests had higher fire severity, because such forests 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…"



(Figure 4 from Lesmeister et al. 2021—values above 1.0 are relatively more likely, and values below 1.0 are relatively less likely)

Lydersen, J. M., M. P. North, and B. M. Collins. 2014. Severity of an uncharacteristically large wildfire, the Rim Fire, in forests with relatively restored frequent fire regimes. Forest Ecology and Management 328:326–334.

> Forests with "a greater small tree density tend[ed] to burn with lower severity."

Meigs, G.W., et al. 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.

Thompson, J.R., Spies, T.A., Ganio, L.M. 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."

Thompson, J., and T.A. Spies. 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."

Thompson, J.R., Spies, T.A. 2009. Vegetation and weather explain variation in crown damage within a large mixed-severity wildfire. Forest Ecology and Management 258: 1684-1694.

Mature forests with higher canopy cover had lower fire severity.

Hardage, K., et al. 2022. Soil moisture and micrometeorological differences across reference and thinned stands during extremes of precipitation, southern Cascade Range. Frontiers in Forests and Global Change 5: Article 898998.

Windspeeds were 15 to 20 times higher in thinned forests relative to unthinned forests.

Graham, R., et al. 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).

Reilly, M.J., et al. 2022. Cascadia Burning: The historic, but not historically unprecedented, 2020 wildfires in the Pacific Northwest, USA. Ecosphere 13: e4070.

Weather conditions primarily determined fire severity, and forest density was not a factor.

"We found minimal difference in burn severity among stand structural types related to previous management in the 2020 fires. Adaptation strategies for similar fires in the future could benefit by focusing on ignition prevention, fire suppression, and community preparedness, as opposed to fuel treatments that are unlikely to mitigate fire severity during extreme weather."

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.

> Thinning plus prescribed burning resulted in the largest fire in New Mexico's recorded history and burned down multiple towns.
>
> Thinning reduced canopy cover, increasing growth of combustible grasses; associated pile burning caused a huge wildfire, spreading rapidly through thinned areas, burning many homes.

Calkin, D.E., Barrett, K., Cohen, J.D., Finney, M.A., Pyne, S.J., and Quarles, S.L. 2023. Wildland-urban fire disasters aren't actually a wildfire problem. Proceedings of the National Academy of Sciences of the United States of America. 120: e2315797120.

> Thinning, and other logging and vegetation removal under the rubric of fuel reduction, in wildlands ostensibly to protect communities from wildfire—the current approach of the Forest Service—is ineffective and counterproductive; instead, the Forest Service should focus directly on helping communities to become fire-safe through proven community-focused methods that are deployed in and immediately adjacent to towns.

In addition, hundreds of scientists from universities and non-governmental organizations also find that, while fire alone can and will modify and reduce subsequent fire behavior, thinning is either ineffective or counter-productive—exacerbating wildfire intensity and effects, killing more trees that it prevents from being killed, and causing a large net reduction in forest carbon storage and a large net increase in carbon emissions relative to wildfire alone—while the only effective way to protect homes and lives from wildfires is to focus on the communities themselves:

Moomaw et al. (2020) (letter from over 200 scientists: https://johnmuirproject.org/2020/05/breaking-news-over-200-top-u-s-climate-and-forest-scientists-urge-congress-protect-forests-to-mitigate-climate-crisis/):

> "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: https://bit.ly/3BFtIAg):

> "[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.

Kelp, M., et al. 2025. Effect of recent prescribed burning and land management on wildfire burn severity and smoke emissions in the western United States. AGU Advances 6: Article e2025AV001682.

> There was no significant effect of thinning on wildfire severity, including thinning in combination with other actions like pile burning and post-thinning prescribed fire, while previous burning (prescribed fire) significantly reduced wildfire severity.

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 approximately 100 feet from homes was effective at protecting homes from wildfires, while vegetation management in remote wildlands was not.

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.

Balch, J.K., et al. 2024. The fastest-growing and most destructive fires in the U.S. (2001-2020). Science 386: 425-431.

> The authors concluded that fast-moving wildfires comprise less than 3% of all U.S. fire events but account for 89% of all structures damaged or destroyed, and that fires move fastest in ecosystems that have "low wind friction" due to sparse or absent tree cover which is associated with a dominance of grasses. Firefighters quickly become "overwhelmed" by fast-moving fires.

Hakkenberg, C.R., et al. 2024. Ladder fuels rather than canopy volumes consistently predict wildfire severity even in extreme topographic-weather conditions. Communications Earth & Environment 5: Article 721.

> In a huge analysis of 42 recent (2019-2021) wildfires in California's forests, dense, mature/old forests with higher canopy cover, higher biomass, and higher densities of "ladder fuels" (defined as seedlings and saplings beneath the forest canopy, less than 33 feet tall), had significantly ***lower*** wildfire severity (Figure 3 of the study). Younger

forests with lower canopy cover, lower biomass, and intermediate densities of seedlings and saplings had the highest wildfire severity.

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

Thinning followed by burning and post-fire logged areas had higher overall fire severity.

"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."

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."

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."

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."

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.

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.

In real-world examples, thinning and post-fire logging in forest wildlands, distant from towns, has been associated with large-scale losses of lives and homes.

The Forest Service's approach in this project—logging across vast areas of forest distant from homes and calling it community wildfire protection—is associated with large-scale losses of homes and lives in wildfires. Previous mechanical thinning and post-fire logging was wildly ineffective and counter-productive as a wildfire management and community protection approach when the Dixie fire occurred, for example. The images below, from the Washington Post, show the devastation of the town of Greenville, after the Dixie fire swept up from the southwest, moving rapidly northeast through vast areas that had been mechanically thinned, before destroying most of the towns of Greenville and Canyondam, along with the smaller town of Indian Falls.

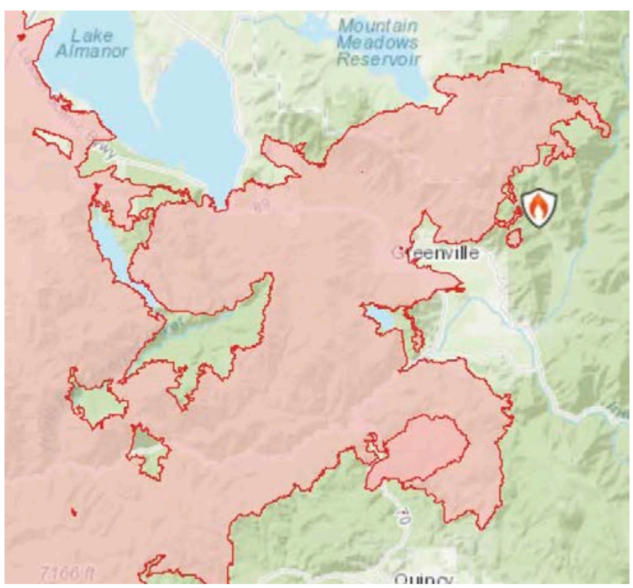

A charred vehicle in central Greenville on Thursday.
STUART W. PALLEY FOR THE WASHINGTON POST


A scorched business in central Greenville on Thursday.
STUART W. PALLEY FOR THE WASHINGTON POST


The damaged central business district.
STUART W. PALLEY FOR THE WASHINGTON POST

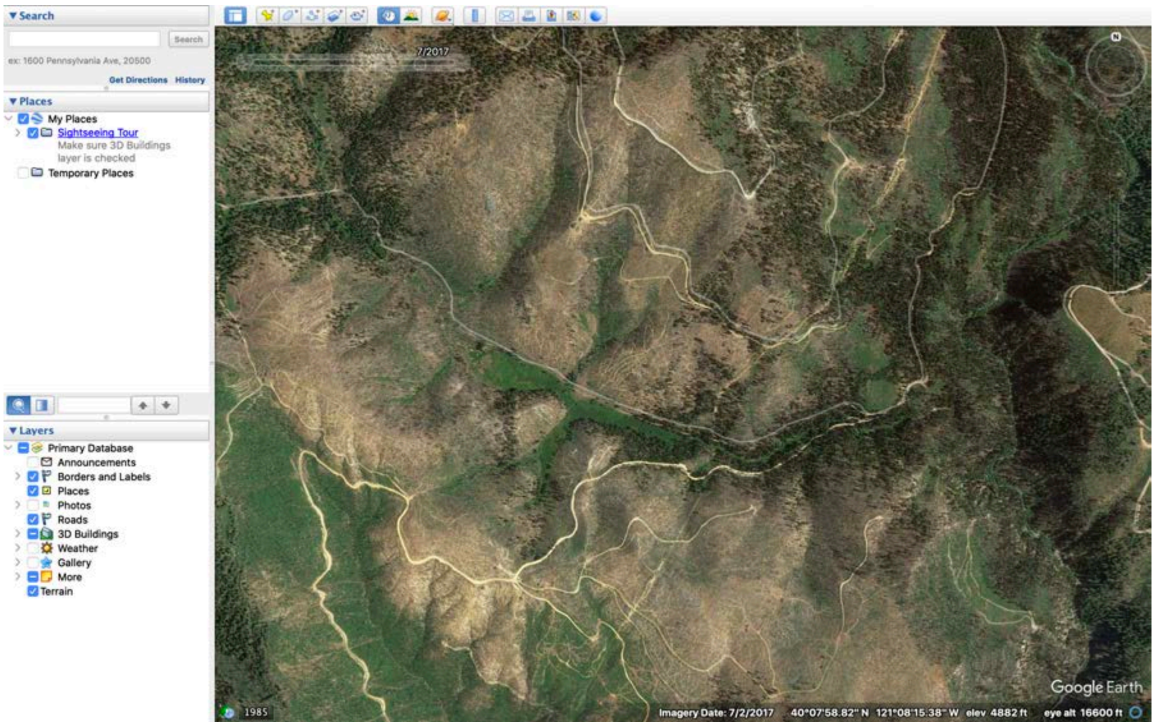
A burning structure in Greenville late Wednesday.
STUART W. PALLEY FOR THE WASHINGTON POST

The images below, from Google Earth, show numerous large areas of pre-fire mechanical thinning and earlier post-fire logging (after the 2012 Chips fire around Butt Valley Reservoir) on the Plumas National Forest, southwest, south, and southeast of the Greenville, Canyondam, and Indian Falls areas, through which the Dixie fire swept before destroying most of the homes and businesses. For each location a pair of images is shown—one after mechanical thinning but before the Dixie fire, and the other after the Dixie fire. GPS coordinates of the imagery locations are shown at the bottom right margin of each. Most of the mechanically thinned and post-fire logged forests burned at high intensity, as the post-fire images show. The images below represent all areas of mechanical thinning and/or post-fire logging of any significant size that could be identified as occurring within 15 years or so prior to the 2021 Dixie fire, and which were within the path of the fire as it approached Greenville, Canyondam, and Indian Falls. As the images show, the Dixie fire burned mostly or entirely at high intensity through all such areas. For spatial context, each of these images shows an area that is several thousand acres in size.



Dixie fire perimeter map showing the area on August 7, 2021, immediately after the fire, moving from the southwest to the northeast, destroyed Greenville and Canyondam. The map is from the inter-agency wildfire site, Inciweb: https://inciweb.wildfire.gov

Image Pair #1: Extensive previous post-fire logging on the Plumas National Forest, northeast of Butt Valley Reservoir, and a short distance southwest of Canyondam. The first image is from July 2, 2017, after post-fire logging, and the second is from August 7, 2021, just one day after the Dixie fire burned through this area and destroyed Canyondam.



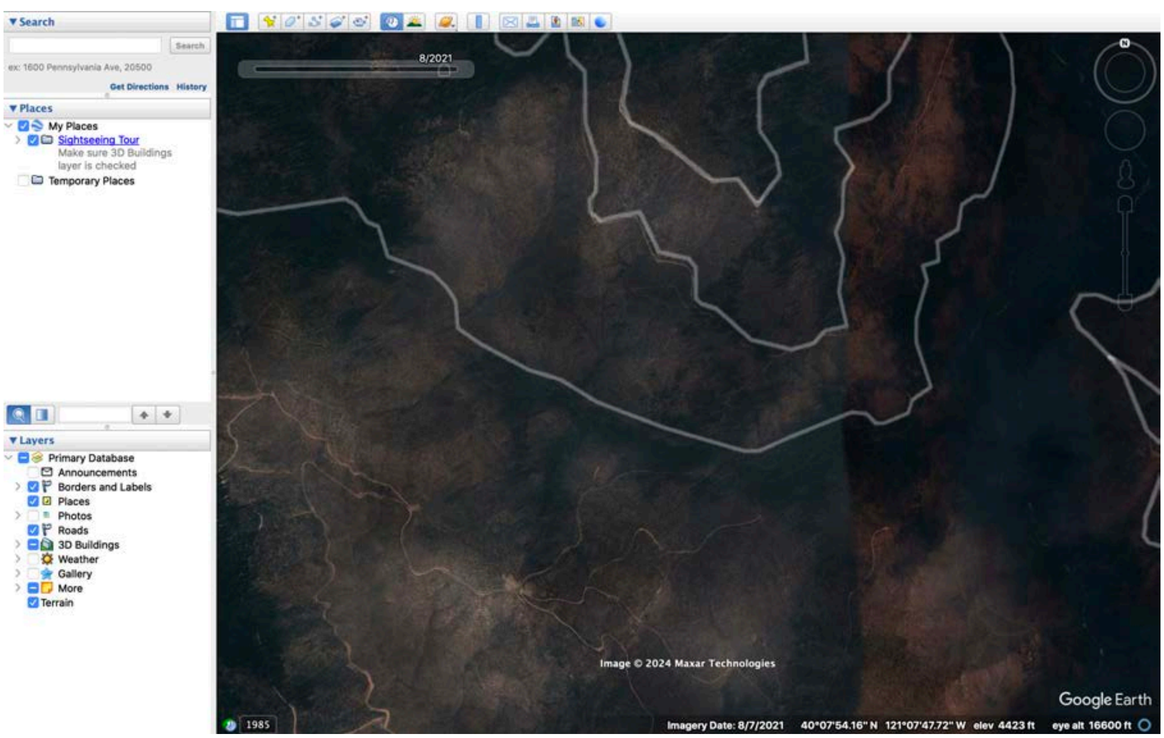
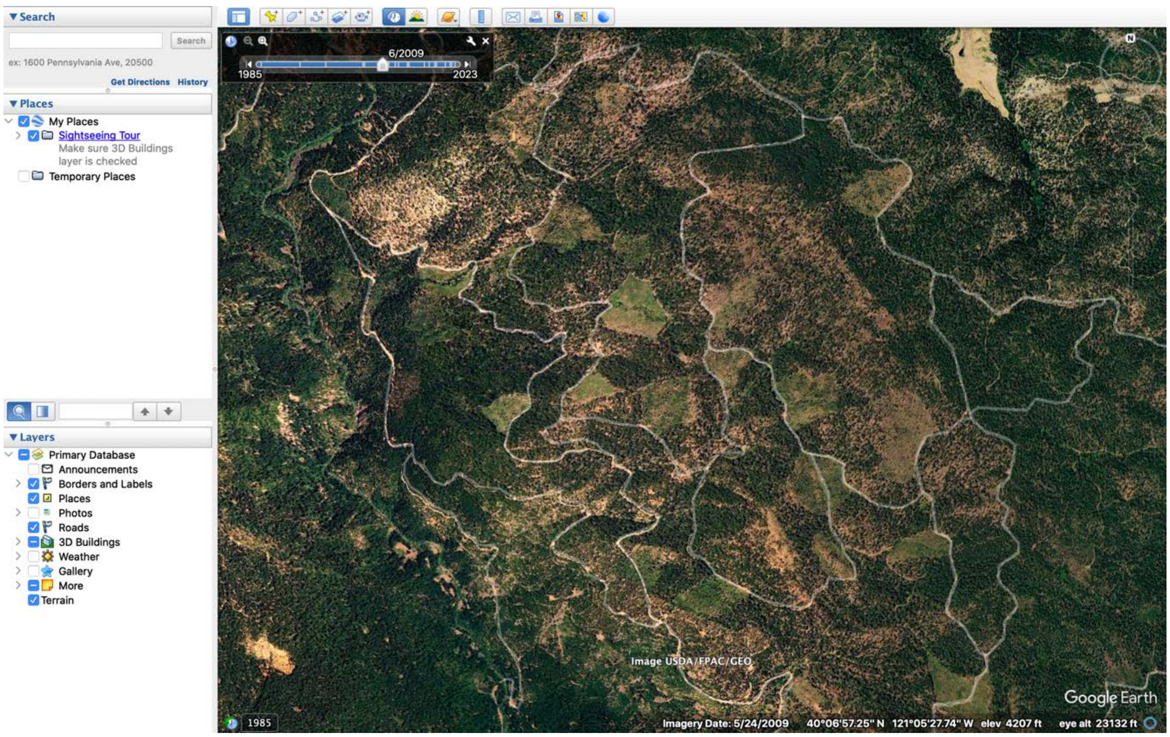


Image Pair #2: A large area that was mechanically thinned south of Canyondam. The first image is from May 24, 2009, after thinning, and the second image is from July 7, 2022 (note the almost total absence of live, green trees remaining in the thinned areas after the Dixie fire).



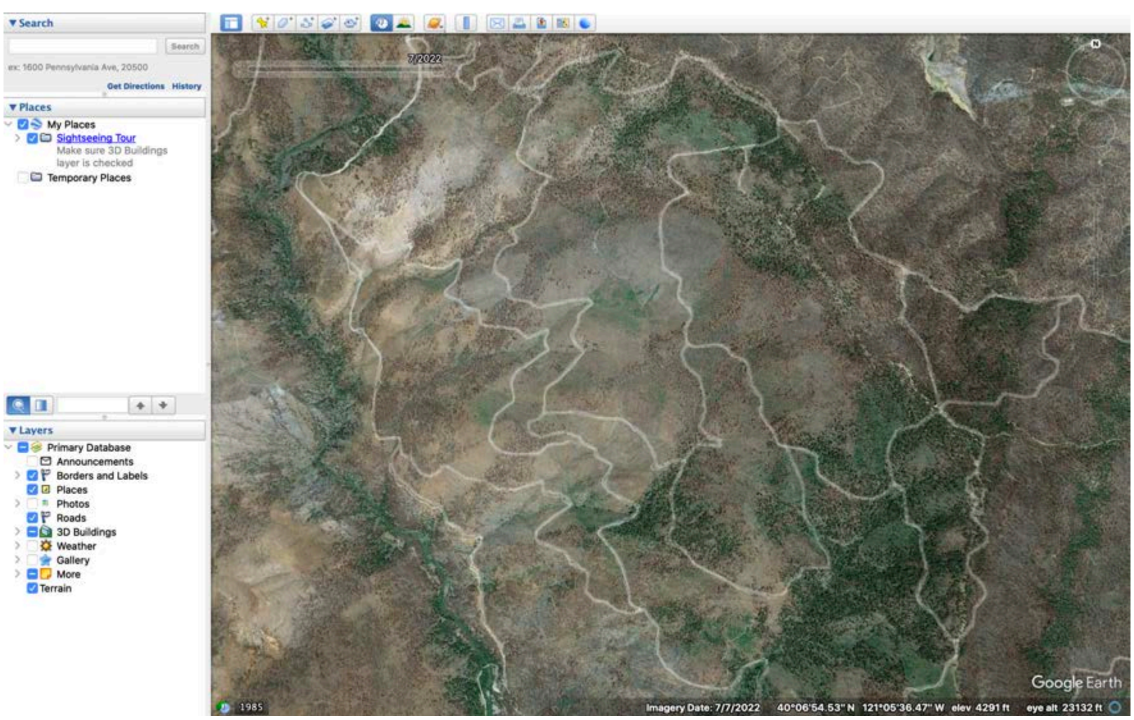
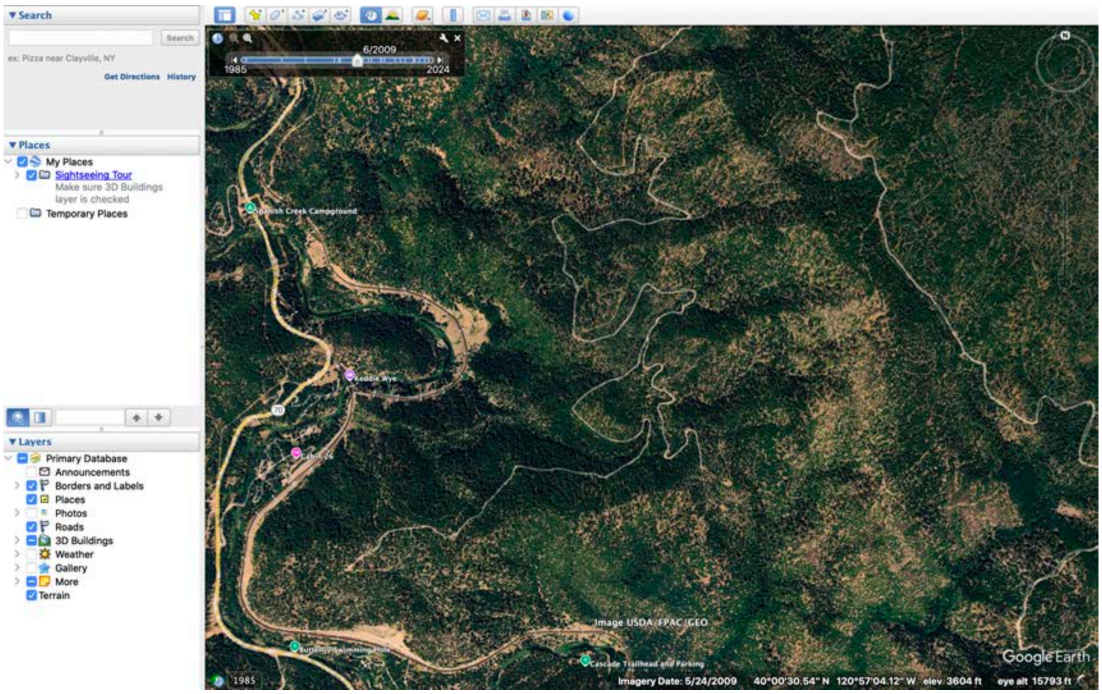


Image Pair #3: Mechanical thinning on the Plumas National Forest, south of Indian Falls. The first image is from May 24, 2009, after thinning, and the second is from July 7, 2022, after the Dixie fire. Note that nearly all of the thinned forest burned at high intensity, with 100% tree mortality in most areas.



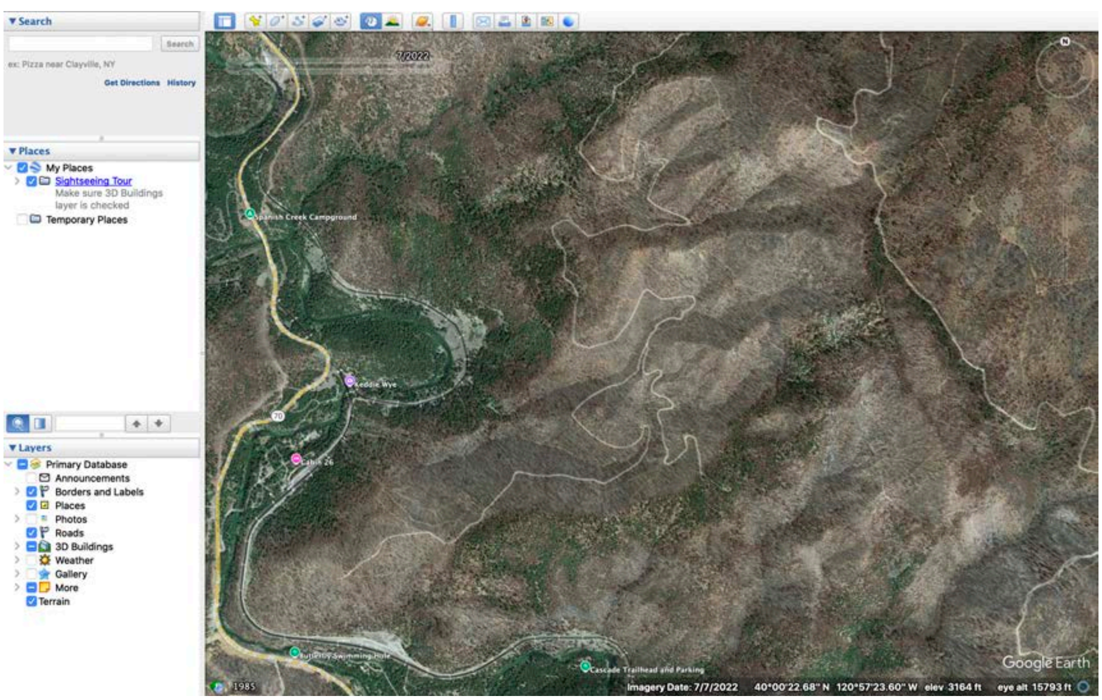
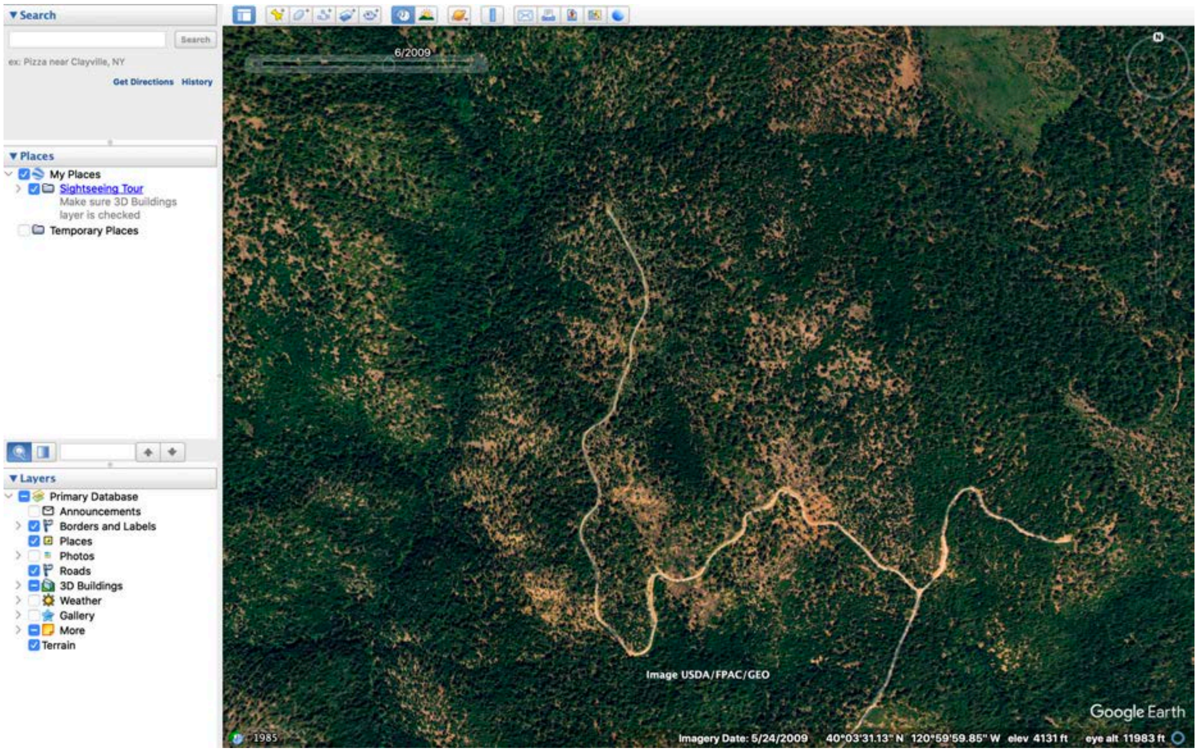


Image Pair #4: Mechanical thinning south of Greenville on the Plumas National Forest. The first image is from May 24, 2009. The second is from July 7, 2022, showing almost complete high-intensity fire effects in the thinned area.



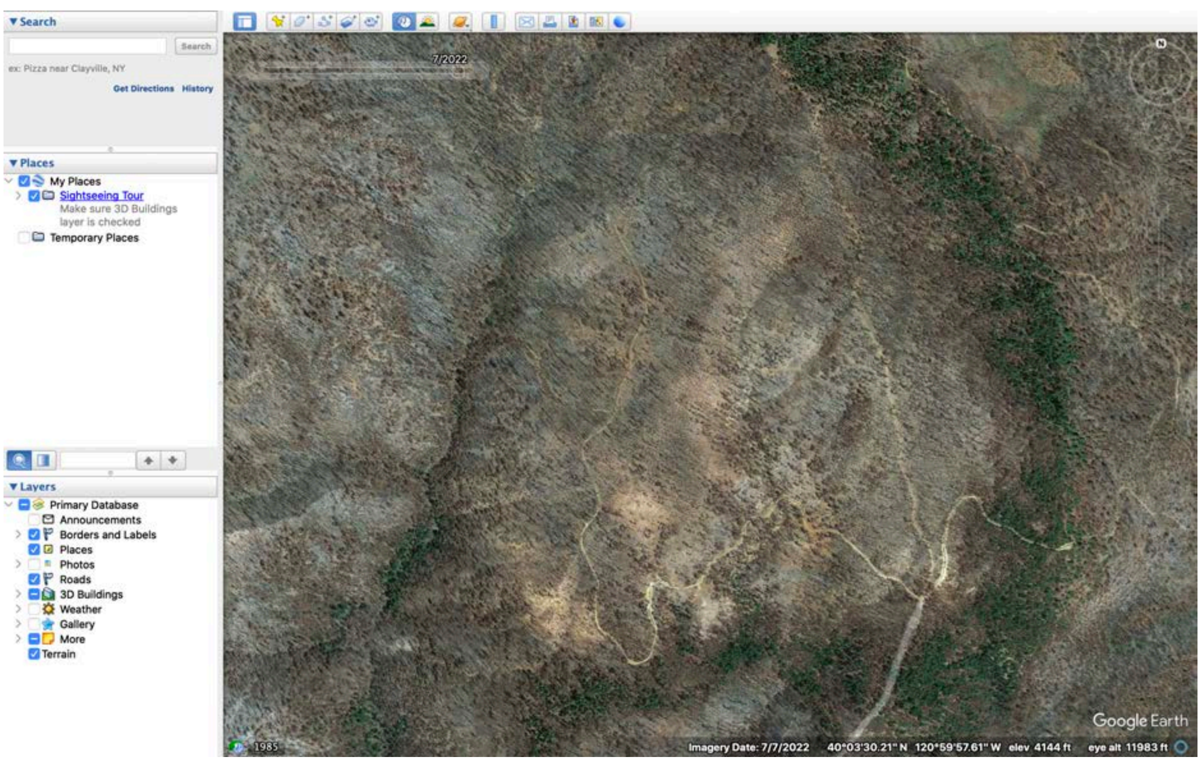
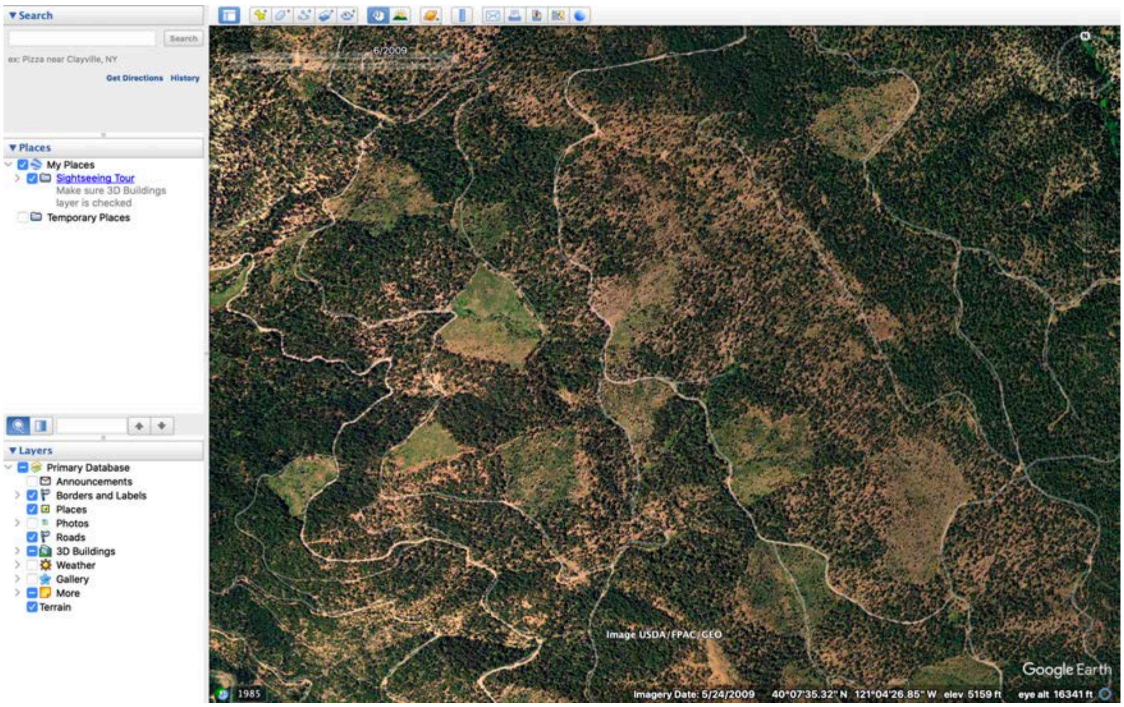


Image Pair #5: Postfire logging and mechanical thinning west of Greenville and south of Canyondam on the Plumas National Forest. The first image is from May 24, 2009, and the second is from July 7, 2022, after the Dixie fire. Once again, note that the thinned area is heavily dominated by high-intensity fire.



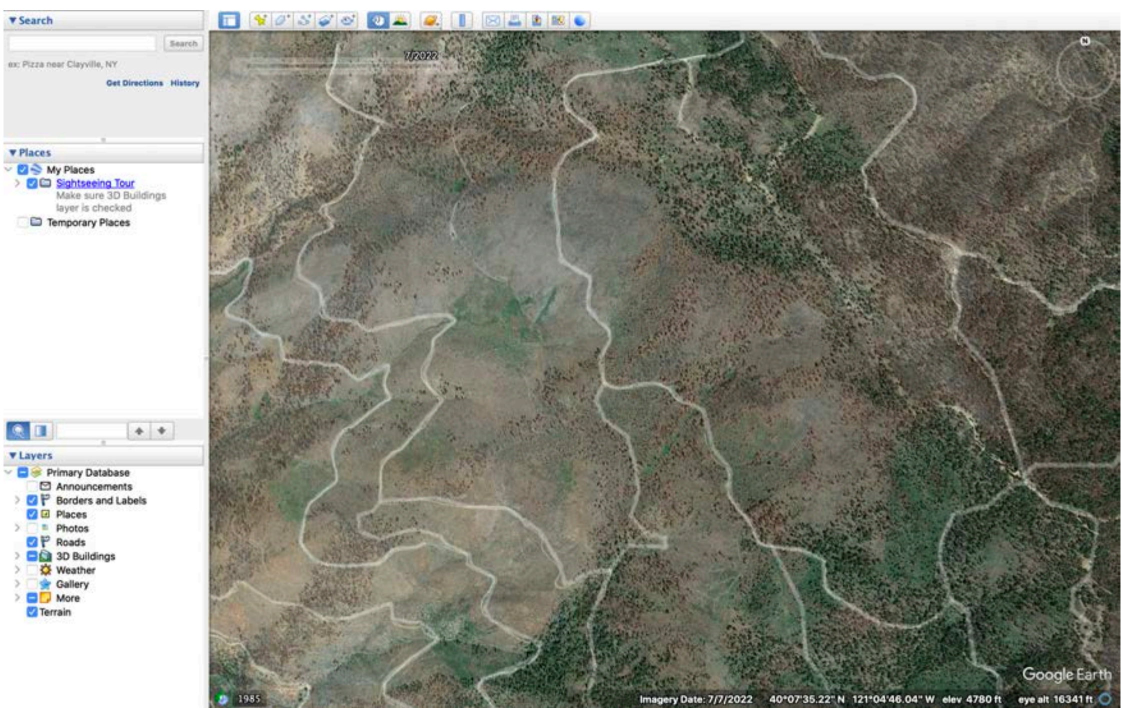
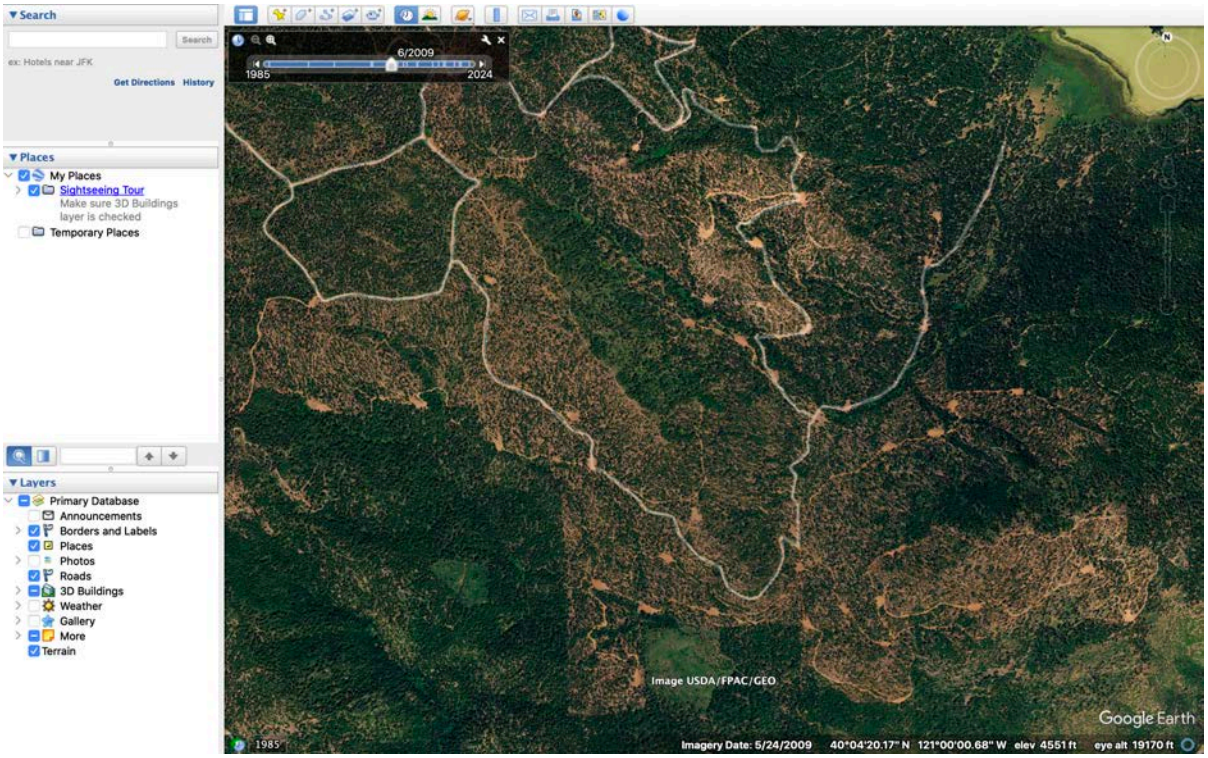
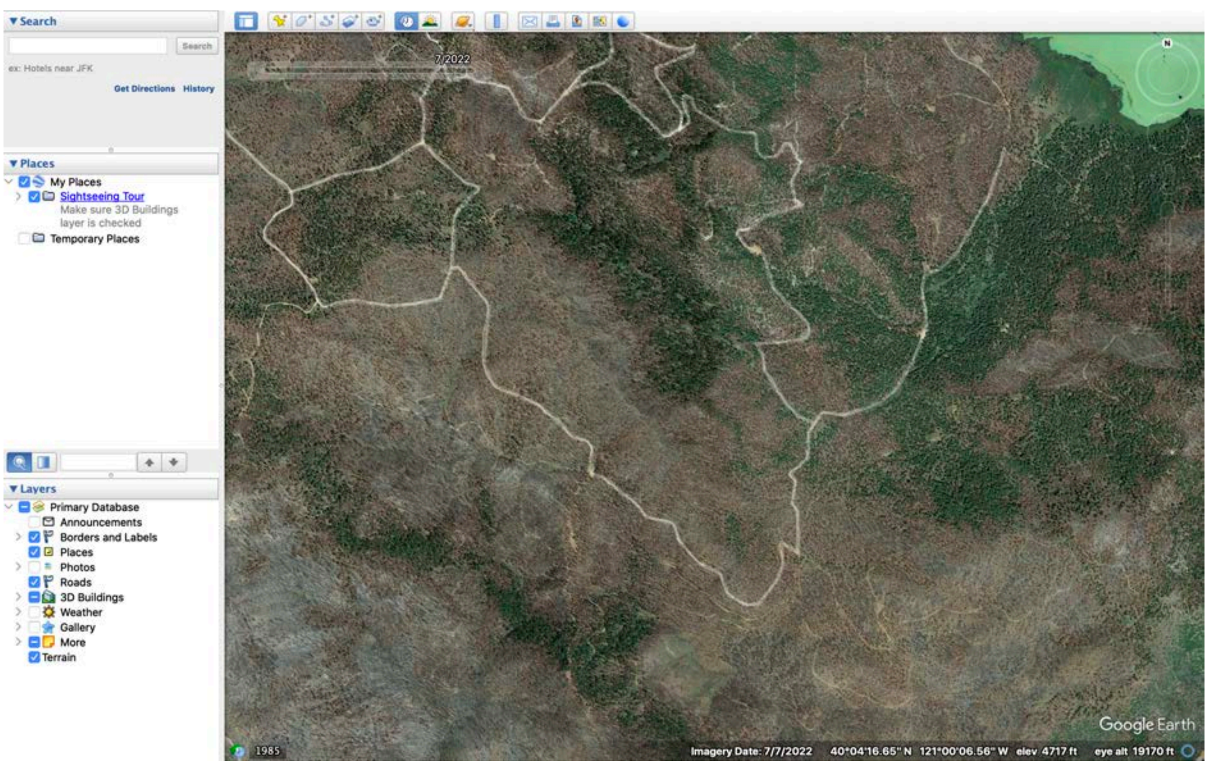
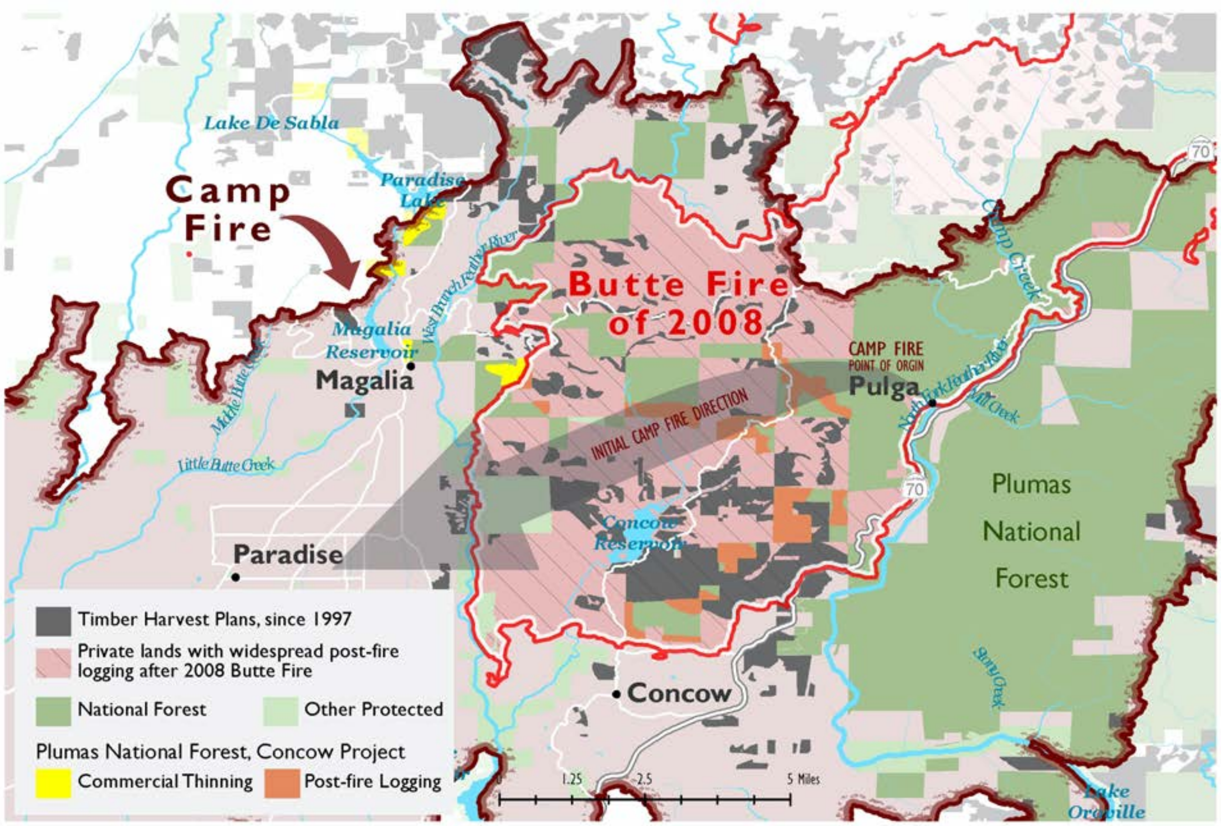


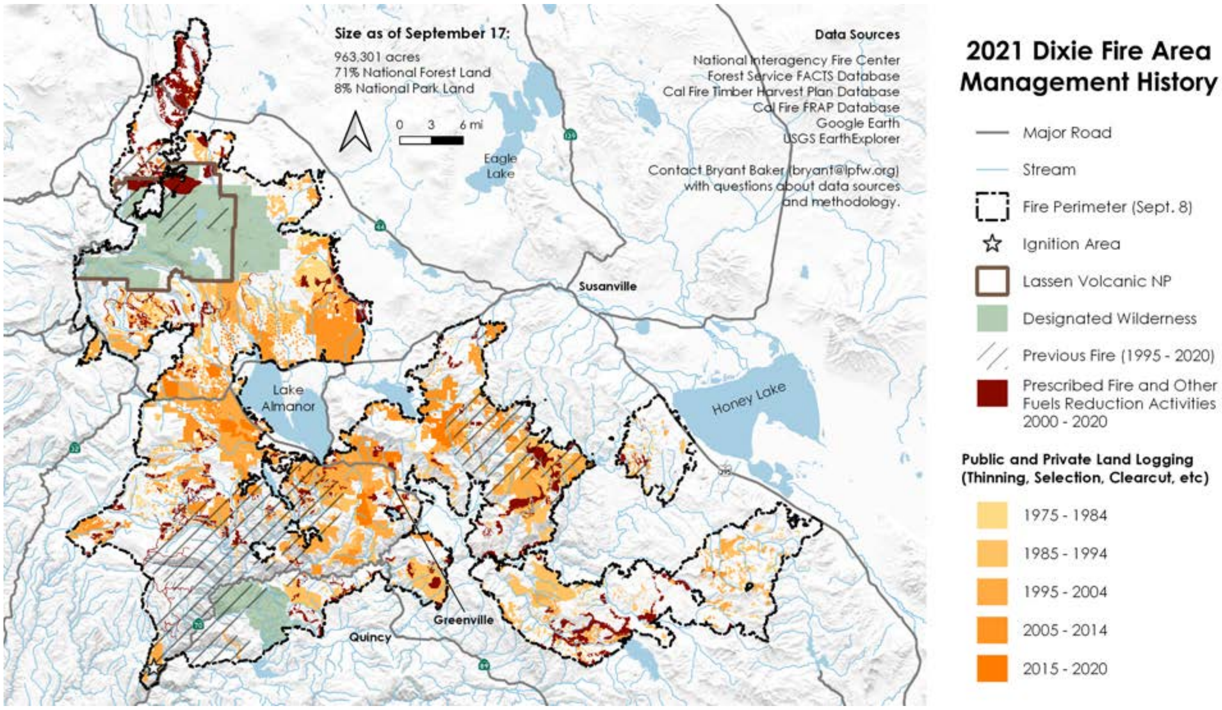
Image Pair #6: Mechanical thinning on private timberlands south of Greenville. The first image is from May 24, 2009, and the second is from July 7, 2022, after the Dixie fire, with the thinned areas heavily dominated by high-intensity fire.

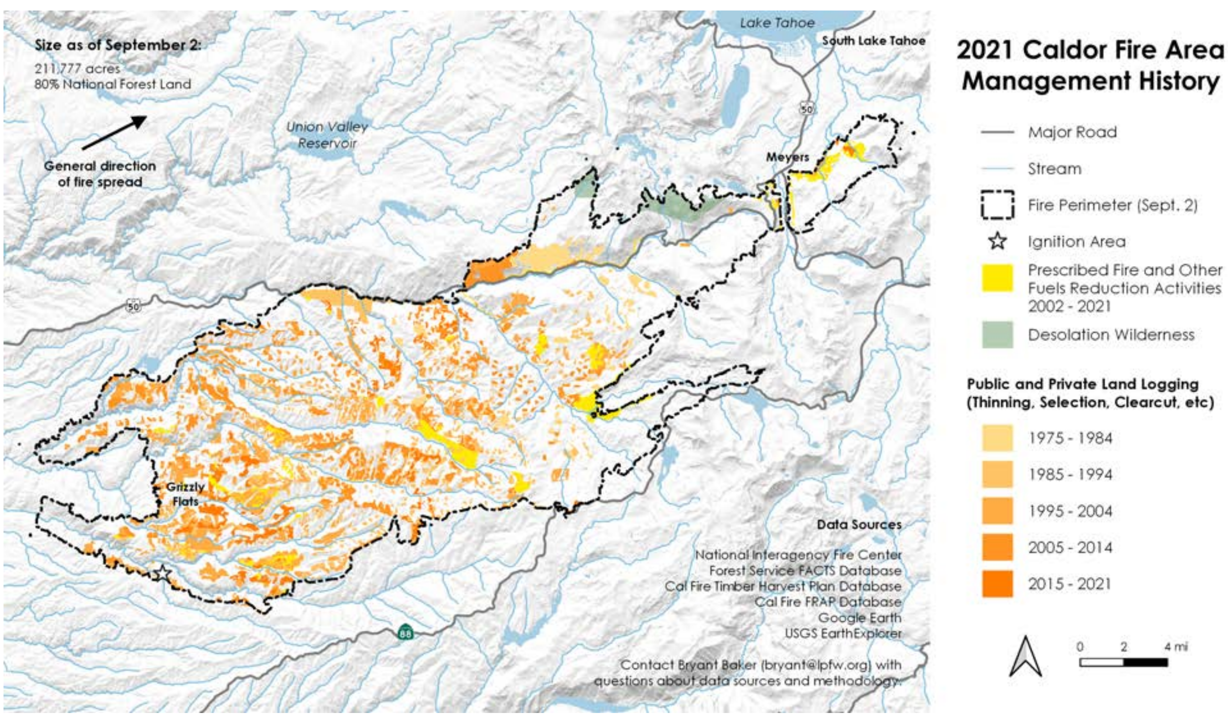


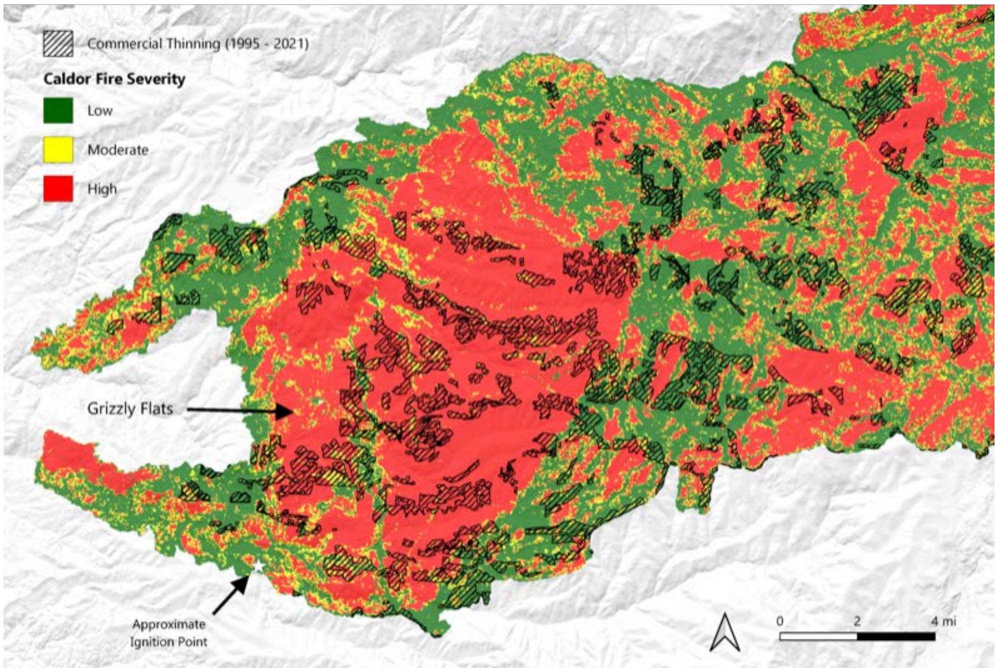


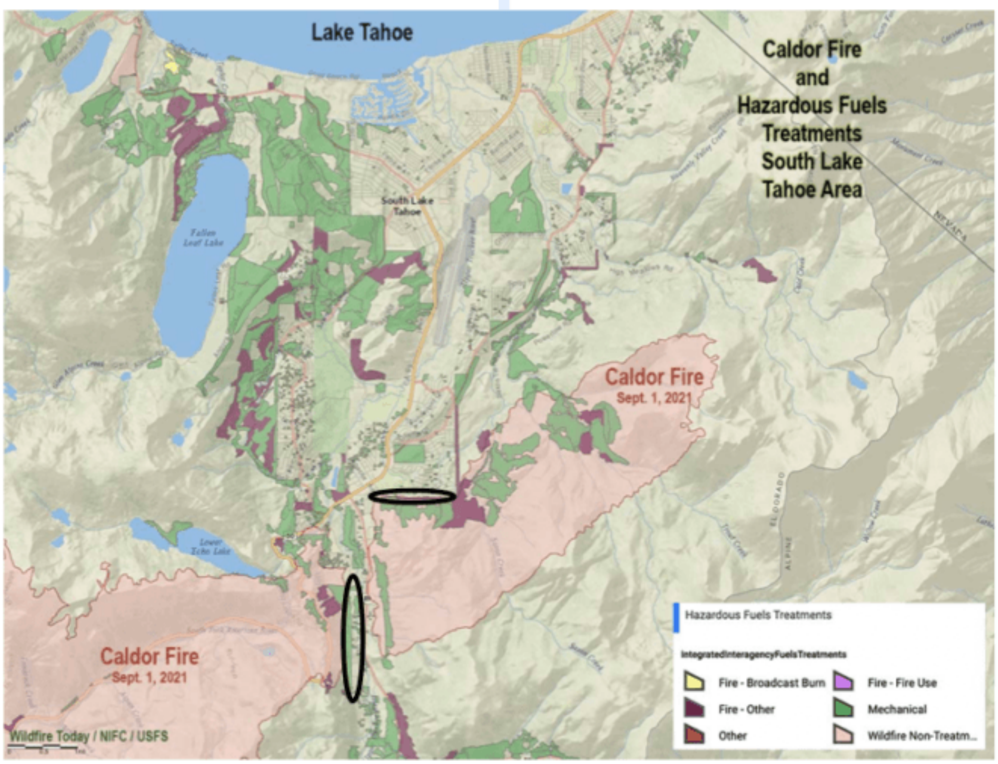
The approach of this proposal—trying to spin backcountry logging as fuel reduction, forest health, and community safety measures—is the same approach that the U.S. Forest Service has pursued for many years, except this proposal promotes this approach on a much bigger scale. In brief, it involves mechanical thinning and other logging of vast forest areas distant from communities based on the claim that this will either directly stop fires from reaching towns or indirectly stop fires by making fires burn much more slowly and so much less intensely that fire suppression crews can easily halt the fire before it reaches a community. This approach is not just a proven failure, it is responsible for increasing wildfire threats to communities, as we have seen in Paradise (Camp fire of 2018), Greenville (Dixie fire of 2021), Grizzly Flats (Caldor fire of 2021), and Berry Creek and Feather Falls (North Complex fire of 2020), among others. Please see the maps below showing large areas of thinning and other so-called fuel-reduction logging around towns that were largely destroyed by the Camp fire, Dixie fire, and Caldor fire, respectively.




2021 Dixie Fire Area Management History
Size as of September 17:
963,301 acres
71% National Forest Land
8% National Park Land
0 3 6 mi
Data Sources
National Interagency Fire Center
Forest Service FACTS Database
Cal Fire Timber Harvest Plan Database
Cal Fire FRAP Database
Google Earth
USGS EarthExplorer
Contact Bryant Baker (bryant@lpfw.org) with questions about data sources and methodology.
Eagle Lake
Susanville
Lake Almanor
Honey Lake
Greenville
Quincy
Major Road
Stream
Fire Perimeter (Sept. 8)
Ignition Area
Lassen Volcanic NP
Designated Wilderness
Previous Fire (1995 - 2020)
Prescribed Fire and Other Fuels Reduction Activities 2000 - 2020
Public and Private Land Logging (Thinning, Selection, Clearcut, etc)
1975 - 1984
1985 - 1994
1995 - 2004
2005 - 2014
2015 - 2020


2021 Caldor Fire Area Management History
Size as of September 2:
211,777 acres
80% National Forest Land
General direction of fire spread
Lake Tahoe
South Lake Tahoe
Union Valley Reservoir
Meyers
Grizzly Flats
Data Sources
National Interagency Fire Center
Forest Service FACTS Database
Cal Fire Timber Harvest Plan Database
Cal Fire FRAP Database
Google Earth
USGS EarthExplorer
Contact Bryant Baker (bryant@lpfw.org) with questions about data sources and methodology.
Major Road
Stream
Fire Perimeter (Sept. 2)
Ignition Area
Prescribed Fire and Other Fuels Reduction Activities 2002 - 2021
Desolation Wilderness
Public and Private Land Logging (Thinning, Selection, Clearcut, etc)
1975 - 1984
1985 - 1994
1995 - 2004
2005 - 2014
2015 - 2021
0 2 4 mi





Map from Wildfire Today, showing the Caldor fire racing right through “thinning” units in wildlands but stopping at or immediately adjacent to private property boundaries, where defensible space pruning had been conducted on private lands and a short distance on to the National Forest. Map accessed here. Black ovals have been added to show where the fire stopped in defensible space areas adjacent to homes.

Significant New Information: The 2004 Framework Assumed that Dense, Mature Forests Must be Mechanically Thinned Before Fire Can be Safely Reintroduced, But New Information Proves This Assumption Was False, and No Mechanical Thinning or Other Tree Removal is Necessary Prior to Burning, Including Managed Wildfire, Prescribed Fire, and Indigenous Cultural Burning.

Even the U.S. Forest Service now acknowledges that "it is known that tree removal is not required before prescribed fire can be used" (USFS 2023a. Community Protection Project – Central and Western Slope. Response to Comments. Plumas National Forest, Quincy, CA). The Forest Service also now admits that thinning plus burning costs six times more per acre than burning alone (USFS 2023b Community Protection Project – Central and Western Slope. Environmental Assessment. Plumas National Forest, Quincy, CA). As Forest Service scientists noted in North et al. (2015: https://courses.seas.harvard.edu/climate/eli/Courses/global-change-debates/Sources/Forest-fires/more/North-etal-2015-short-perspective.pdf), "…fire is usually more efficient, cost-effective, and ecologically beneficial than mechanical treatments." Because no thinning is necessary prior to burning, lower-intensity prescribed natural fires (managed wildfires), controlled burns, and Native American cultural burning can be applied in a very cost-effective way within areas where low-intensity surface fire is in deficit (Baker et al. 2023b: https://www.mdpi.com/2571-6255/6/11/428).

Even thinning of small, subcanopy trees is not necessary prior to introducing or restoring fire, based on numerous studies, most of which were authored by Forest Service and other government scientists. The table below concisely summarizes some of the many studies indicating that fire alone can be applied, during natural fire season, in Western U.S. conifer forests without prior tree removal, including in the very densest and most long-unburned forests. Land managers simply conduct or allow burning during mild to moderate fire weather.

Study	Type of Fire	Brief Summary of Significance
McClure et al. (2024)	Managed wildfire and controlled burn	Documenting successful use of managed wildfires and controlled burns over 35 years in forests of the Southwestern U.S., with overwhelmingly low-intensity fire effects
Knapp and Keeley (2006)	Controlled burn	Effective lower-intensity prescribed fire, during both early and late fire season, in a dense forest with 301 square feet per acre of basal area that had not burned for 123 years
Knapp et al. (2005)	Controlled burn	Effective lower-intensity prescribed fire, during early and late fire season, in a dense forest with over 80 tons per acre of surface fuel, which had not burned in over 120 years

York et al. (2022)	Controlled burn	Successful lower-intensity spring and fall prescribed fire in 13-14 year-old mixed-conifer plantations with 170 trees per acre
Stephens et al. (2021)	Managed wildfire	Successful mostly lower-intensity managed wildfire over several decades, in unmanaged mixed-conifer forests of Yosemite National Park
Zachmann et al. (2018)	Controlled burn	Successful lower-intensity prescribed fire in a 20-year analysis in dense mixed-conifer forests of the Lake Tahoe Basin, with 204 trees per acre and 257 square feet of basal area per acre
van Mantgem et al. (2013)	Controlled burn	Successful lower-intensity prescribed fire in seven national parks, monuments, and recreation areas in different forest types, including ponderosa pine, across the Western U.S.
van Mantgem et al. (2011)	Controlled burn	Successful lower-intensity prescribed fire in September and October in a dense forest that had not burned since circa 1870, and had 81 tons per acre of surface fuel, and 170 trees per acre
Collins and Stephens (2010)	Managed wildfire	Successful application of mostly lower-intensity managed wildfire, over 30 years in mixed-conifer forests of Yosemite National Park
Webster and Halpern (2010)	Controlled burns and managed wildfires	Successful application of lower-intensity controlled burns and managed wildfires over two decades in unmanaged mixed-conifer forests of Sequoia and Kings Canyon National Parks
Kobziar et al. (2009)	Controlled burn	Effective application of lower-intensity prescribed fire in the last week of June within a 32-year old ponderosa pine and Jeffrey pine plantation, with 149 trees per acre
Collins et al. (2007)	Managed wildfire	Mixed-intensity managed wildfires successfully restored natural habitat heterogeneity in Yosemite mixed-conifer forests

<u>Significant New Information: Dead Trees Do Not Increase Wildfire Behavior.</u>

The 2004 Framework assumed that patches of dead trees increase wildfire hazard, and that removing such patches of dead trees will reliably reduce wildfire intensity and behavior.

The overwhelming weight of science from the largest and most comprehensive studies find either no effect of higher densities of snags on wildfire intensity/severity (Bond et al. 2009, Hart et al. 2015, Hart and Preston 2020, Hanson 2021), or finds lower overall wildfire severity in areas with higher levels of snags and downed logs from previous tree mortality resulting from drought and native bark beetles (Meigs et al. 2016). Removing dead trees ("salvage logging"), on the other hand, tends to increase wildfire intensity and effects (Donato et al. 2006, Thompson et al. 2007, Thompson and Spies 2010, Hanson 2021).

<u>Significant New Information: Complex Early Seral Forest Habitat, Created by High-Intensity Fire and Pockets of High Tree Mortality from Drought and Native Bark Beetles,</u>

is One of the Most Ecologically Important of All Forest Habitat Types, and Many Native Wildlife Species Depend Upon This Habitat.

The 2004 Framework assumed that patches of high-intensity fire simply destroy and eliminate wildlife habitat, and must be prevented and avoided at all costs. The 2004 Framework's provisions do not contain any meaningful protections for habitat *created* by high-intensity fire patches. The Framework allows 100% of complex early seral forest habitat to be post-fire logged and destroyed in patches less than 1000 acres in size and, for patches larger than 1000 acres, the Framework allows at least 90% of complex earl seral forest habitat to be post-fire logged, including merely an optional suggestion that 10% of such habitat be retained unlogged "generally". In fact, the Framework did not even clearly recognize complex early seral forest as a distinct forest habitat type (the term complex early seral forest did not even exist in 2004).

However, patches of snags in combination with the native montane chaparral, resulting from high-intensity wildfire or drought and native bark beetles, are called "complex early seral forest habitat", also known as "snag forest habitat". This unique forest habitat type is comparable to old growth forest in terms of native biodiversity and wildlife abundance, based on quite literally hundreds of scientific studies on this subject, which are cited and summarized in two books, DellaSala and Hanson (2024: https://shop.elsevier.com/books/mixed-severity-fires/dellasala/978-0-443-13790-7) and Hanson (2021: https://www.kentuckypress.com/9780813181073/smokescreen/), and detailed in numerous peer-reviewed studies, including: Hanson and North (2008); Buchalski et al. (2013); DellaSala et al. (2014); Hanson (2014); Tarbill et al. (2015); White et al. (2016); DellaSala et al. (2017); Hanson (2018); White et al. (2019); Hanson and Chi (2020); Hanson and Chi (2021). Many native wildlife species depend upon this habitat.

Sincerely,

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