



Forestry Solutions to California's Wildfire Crisis

A Position of the California Society of American Foresters (Cal SAF)

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Preface

Searing wildfires have laid waste to seasonally dry California forests on a frightening scale, far beyond any historical precedent. Foresters know why this is happening and what needs to be done.

A 21st Century forestry reset, based on the latest peer-reviewed science, is needed to protect remaining stands of ancient trees and old forest ecosystems, and to replenish severely burned areas that have become deforested. Corollary benefits will include safer adjacent communities and emergency responders, the retention of functioning upland watersheds, less uncontrolled emissions of toxic smoke, lower fire suppression and recovery costs, greater long term carbon storage and sustainable economic benefits.

We call upon the public, policymakers, and the media to carefully weigh conflicting claims and to be wary of promoting views that are presented as established science but may in fact be misinformation offered in support of a preconceived agenda.

Purpose

California's native forests and woodlands are being altered by high severity fire at an alarmingly rapid rate and scale. SAF's position paper "Wildland Fire Management" provides a national perspective on the wildfire issue (SAF 2019a). This paper focuses on California's unique situation in terms of values at risk and the critical role of professional forest management in creating fire resilient forests in a warming climate. This document replaces the 2019 California SAF policy statement titled "California's Wildfire Emergency."

Scope

This position statement applies to the fire-adapted seasonally dry forests and woodlands of the state of California.

Position

Urgent management actions must be taken to reduce the occurrence of highly destructive “megafires” (defined as high severity fires over 100,000 acres) which affect entire forested watersheds, level small communities, eliminate mature forest ecosystems, blanket large areas in dense smoke, and create vast vegetation type conversions.

Strategically applying forest management techniques in unnaturally dense forests can and must be utilized to reduce highly flammable accumulations of woody debris. It is imperative that these treatments be planned and implemented by integrated groups of resource professionals including professional foresters. They must be performed by a well-trained workforce and supported by an appropriately scaled utilization infrastructure. It is also critical that implementation occur at an appropriate pace and scale in cooperation with interested stakeholders and landowners. The objective of this coordinated large scale applied forest management initiative would be to lower the risk of frequent large, high severity wildfires with their myriad negative effects, leading to more sustainable and resilient future conditions.

A vital forest products sector is a key component to restoring forests. This issue is discussed in detail in SAF’s position statement on Forest Products Industries and Markets (SAF 2019b). Utilizing excess woody biomass creates multiple benefits (SAF 2019b, Springsteen, et al. 2015). Significantly more land can be treated if costs are offset by the value of the excess material removed as byproducts of forest restoration/fuels reduction efforts.

The rapid increase of deforested conditions on California’s National Forest lands must be recognized and reversed.

Issue

California is experiencing an unprecedented loss of forest cover from high severity wildfire. Accumulating woody fuels, drought and climate change are contributing factors, aggravated in recent decades by a sociopolitical reluctance to actively manage forests (Jones et al. 2022) and limited public funds for pre- and post-fire forest management work. Dense forests with high levels of tree mortality are particularly at risk of high severity fire (Stephens et al. 2022). Large areas have burned at high severity, often reburning at intervals that do not allow sufficient natural recovery time. This has already led to large-scale conversions of forests to brush or grass (Coop et al. 2020). Such forest loss can greatly reduce above ground carbon storage. This trend is expected to increase with climate change and may result in permanent deforestation (Coop et al. 2020). These large, unpredictable fires have also caused loss of human life, property, and well-being in many communities.

Background

Most of California’s forests exist in what is described as a Mediterranean climate, characterized by cool, wet winters followed by lengthy periods of summer drought. Given the annual occurrence of hot, dry conditions and wind events, the threat of uncontrolled forest and wildland

fires is an ever-present reality facing rural residents, landowners, and managers, including foresters and affiliated resource science professionals.

Nature, Interrupted

California has a long history of fire management by Indigenous people, who use fire for a variety of land management purposes. Lightning-sparked fires were also common and widespread. Taken together, these frequent, typically low intensity fires had the effect of clearing forest undergrowth and accumulated fuel, stimulating new vegetation growth and leading to open forests dominated by large trees with patchy mosaics of smaller trees and brush (Safford and Stevens 2017).

The gold rush brought an influx of primarily Euro-American miners and settlers, displacing most native people and terminating their land management practices. Forests were exploited for timber and cleared for agriculture. In the 20th century, land managers, including professional foresters, instituted a policy of aggressive fire suppression, based upon the premise that fire was the enemy and that the natural system could be more beneficially regulated without it.

These 20th Century fire exclusion and suppression policies eventually led to unintended consequences in fire-adapted forests. Historically low levels of flammable vegetative fuels steadily accumulated, leading to unnaturally dense forests and correspondingly explosive volumes of flammable surface litter and debris (Safford and Stevens 2017, Hagmann et al. 2021). In addition, as California's population increased after World War II, a housing boom was created which led to increased timber harvests on National Forest lands to meet demand for lumber. Many people chose to build homes in forested areas. This created large areas of "wildland-urban interface" (WUI) that required fire suppression resources to protect. These structures and associated infrastructure served as ignition sources and as fuel.

By the late 1970s, the Forest Service began to adopt more intensive forestry methods such as clearcuts and planted forests. Media scrutiny and changing public values led to a powerful backlash and a push for greater forest preservation, decrying existing practices and their ecosystem impacts. At the time, the issue of wildfire risks took a back seat to concerns about protecting old forests and their habitat, progressing in some cases to activism in support of an end to all commercial logging (Sierra Club 1996, National Forest Protection Alliance 2001).

As a result of this debate about how forests on public lands should be managed, National Forest harvest levels rapidly declined in the 1990s (USDA Forest Service 2022). There were corresponding reductions in the management of woody fuel loads and tree densities. The infrastructure, equipment, and skilled labor to support the forestry sector dwindled, along with the economic vitality of dozens of rural California communities.

The Megafire Era Begins

By the 21st century, the management of California's National Forests was largely custodial. The global climate, however, was warming in response to increased levels of greenhouse gases, ushering in fire seasons that now start earlier and last longer, contributing to wildfires of

increased size and intensity.

Flammable wood and debris have continued to accumulate. Large-scale bark beetle outbreaks occurred in the southern Sierra Nevada and in southern California with few opportunities to mitigate conditions or to remove dead trees. Fire exclusion policies have persisted, and some environmental groups remain committed to opposing the removal of commercial size trees from federal public lands under any circumstances. WUI development has continued to increase with limited planning and building restrictions for wildfire concerns.

Wildfire size, intensity and frequency have all grown with alarming speed. The eight largest California wildfires on record have occurred in just the last five years. The fifteen largest have all happened since 2003 (CAL FIRE 2022).

The scope and scale of these fires has overwhelmed the existing capacity of National Forest land managers to reforest burned acres. As a result, the amount of deforested land has grown significantly in the past decade (USDA Forest Service 2021). The latest estimate of the Region 5 USDA Forest Service, including added data from 2021 wildfires, is 1.45 million acres (USDA Forest Service 2022, the equivalent of a swath, 6.5 miles in width, stretching from Los Angeles to San Francisco. Researchers have also documented localized extinctions of sensitive species, such as the California spotted owl, because of megafire impacts on old forest habitat (Jones 2022).

The rapid increase in western wildfire size and intensity has caught the attention of local, state, and federal agencies, resulting in action plans and potential increased funding aimed at the problem. One example is California's Wildfire and Forest Resilience Action Plan (2021). The future will show if the recommended measures are successfully carried out and, most important, result in meaningful change to the current trend.

Recommendations for Conserving and Replenishing the Land

Systemic reform is needed to restore and maintain California's seasonally dry native forests and woodlands. The best time to fight a wildfire is before it begins. Fire requires three components (the "fire triangle"): oxygen, heat, and fuel. The only component we can readily change, and with immediate benefit, is fuel.

Necessary fuel reduction work will include a full range of forest management activities including reducing tree densities through timber harvest, mechanical treatment of surface and ladder fuels, forest thinning, chipping, pile burning, managed and prescribed fire. A full range of silvicultural systems should be considered on a site-specific basis.

By modifying woody fuel densities and spatial arrangements, wildfire behavior can be influenced, and its severity reduced. Less explosive wildfires make emergency suppression efforts safer, less costly, and more effective. The work should take place near communities and infrastructure as well as in strategically placed treatments in the forests generally, away from developed areas.

Increased forest resiliency from large-scale treatments has multiple benefits, including

maintaining or improving water quality and quantity, forested wildlife habitat, air quality, recreation, and carbon storage. A landscape approach to fuels reduction should be used to break up fuel loads throughout California's forestlands (North et al. 2021, Evans et al. 2022). The objective of treating the larger landscape is to restore fire resilience that would over time allow wildfires to burn relatively safely, thus restoring fire as an important habitat element of the California landscape (North et al. 2021).

Smaller scale treatments such as fuelbreaks should focus on community protection, protection of rare species (e.g., giant sequoia) and/or reduction of ignition risks such as powerlines, roads, or railroads. Strategic treatments also provide options for fire suppression or prescribed fire by creating relatively safe areas to conduct operations and stage firefighters.

The scientific record supports the efficacy of pre-fire fuel treatments (Prichard et al. 2021, Hessburg et al. 2021, Stephens et al. 2020a, Stephens et al. 2020b). Research also suggests that there may be a need to reduce tree densities even more for the purposes of both ecological restoration and adaptation to projected climate change (North et al. 2021, Murphy et al. 2021, Bernal et al. 2022). Mechanical thinning as a pre-treatment can reduce the risk of maintenance prescribed burning, especially when the burn window is narrow and burning is near populated areas.

Unfortunately, mistrust and misinformation are still widely disseminated. Fortunately, credible researchers are pushing back against questionable claims made by purveyors of "agenda-driven" science (Sabelow and Kasler 2021, Peery et al. 2019, Jones et al. 2022). Another issue of concern is that media reports on megafires often focus exclusively on climate change and/or drought as the causative factor(s), to the detriment of more comprehensive public understanding of the complex ecological dynamics on the ground.

Ramping up fuel treatments and reforestation efforts will require public support and trust for managing the land based on sound applied science. It may be that third party oversight could be used to help gain the necessary transparency and trust on public land (Hrubes 2022). Entities such as the Sustainable Forestry Initiative or the Forest Stewardship Council could potentially supply those services.

On publicly managed and multi-jurisdictional landscapes, collaborative forestry management groups have formed to build trust, share knowledge, work through bureaucratic processes, and create support for risky or controversial forest management activities such as prescribed fire, managed fire, fire in the WUI, and commercial timber harvesting (Butler and Schultz 2019; Kelly et al. 2019; Schultz et al. 2018, Moritz et al. 2022). Such groups can benefit from long-term funding mechanisms that allow for project and infrastructure development.

Fuel treatments are expensive. The current pace and scale of fuel treatments are clearly inadequate (Brown et al. 2021), as is reforestation on National Forest lands following large fires (Stephens 2020a). These projects are currently dependent upon the allocation of limited public funds. Chronic underfunding can be helped in many settings by allowing for the existence of a skilled workforce and an appropriately scaled utilization infrastructure supporting the

commercial utilization of excess woody material to offset costs (North et al. 2021) and to mitigate air emissions from current pile burn disposal techniques (Springsteen 2015). Medium and small sized sawlogs and other forest products have potentially significant value when sawmills, biomass plants and other forest products infrastructure exist nearby. This material can be turned into useful products rather than being treated, at significant cost, as waste and abandoned or burned on site. Regardless, the economics of fuel treatments should factor in avoided fire suppression costs, the human and ecological benefits of avoided high severity wildfires, and climate benefits associated with a reduction of wildfire-generated emissions, without an expectation of projects paying for themselves solely in product value (Hrubec 2022, Evans et al. 2022).

The need for action is urgent. The rate of loss of forest cover and stored carbon, damage to watersheds and soils, wildlife habitat and human communities is unprecedented but reversible. Science-based professional forest management at a greatly increased pace and scale will help restore and perpetuate the natural environment that all Californians depend upon.

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