



**PACIFIC FOREST TRUST**  
Private Forests. Public Treasures.



**Sierra Forest Legacy**  
*Protecting Sierra Nevada Forests and Communities*

**To:** Krystal Beckham, Little Hoover Commission Project Manager  
**From:** Paul Mason and Abby Halperin, Pacific Forest Trust  
Craig Thomas, Sierra Forest Legacy  
**Date:** January 3, 2017  
**Re:** Little Hoover Commission Review of Forest Management

As the Little Hoover Commission sets forth on a much-needed critical examination of forest management practices in light of the recent tree mortality crisis, we are happy to provide background context for current conditions. We are also pleased to share the following recommendations to help increase forest resilience to disturbance and secure the many benefits forest provide. Based on a review of past forest management, we recommend that:

1. Fire needs to be restored to the landscape as a core ecological process, at significant ecological scales across California,
2. A broad range of tools should be considered to increase forest resilience, and
3. Private landowners need incentives for changes in management.

Each of these recommendations is built on greater coordination among state agencies and collaboration with federal and private partners.

## **Background:**

**Past management decisions for California's forests have created unnatural conditions that decrease the capacity of these forests to respond to disturbance.**

It is a well-established ecological principle that more diversity leads to greater resilience to disturbance (Hooper et al., 2005). However, many of the forest management practices over the past century have done precisely the opposite by creating even-aged homogeneous forests that are overstocked. Fire exclusion has also created natural stands with dense understories composed of fire-intolerant species. This lack of diversity in forest structure, species, and age class is compounded by development patterns that have increased forest fragmentation and placed more human structures in proximity to potential damage from fires (Theobald and Romme, 2007).

One valuable ecological tool for creating diversity on the landscape is fire. Many of California's forests are fire-adapted. Fire is a core ecological process that increases patchiness at the landscape scale, improves forest resilience by reducing surface and ladder fuels, prevents the shift to fire-intolerant species, and increases the diversity of habitats available to species adapting to climate change. Managed fires (i.e., allowing natural fires to burn under certain conditions) and prescribed burns are also important tools to reduce fuel loads in overstocked forests that might otherwise burn at high severity (Sapsis et al., 2016).

Historic fire regimes were much more frequent than they are today (Baker, 2015; Hurteau et al., 2014; Mallek et al., 2013; Marlon et al., 2012; Steel et al., 2015; Stephens et al., 2007; van de Water and Safford, 2011; Whitlock et al., 2003). For instance, Stephens et al. (2007) estimate that during pre-settlement times California fires burned roughly 4.45 million acres annually and that from 1950-1999, fires burned only 5.6% of the area that would have burned in the pre-settlement era. The drop in fire caused primarily by fire suppression policies has created a substantial “fire deficit” where the fire activity is far below what would be expected under current climatic conditions (Marlon et al., 2012). This dramatic reduction in fire activity has severe, ecological, economic, and public health and safety impacts across California.

## Recommendations:

Building on the wealth of historical and ecological knowledge, there is ample research to support forest policies that encourage more natural conditions and increase resilience. However, many state policies continue to perpetuate forest mismanagement, particularly indiscriminate fire suppression and forest practices that reduce complexity and create excessively dense even age conditions. Moving forward to address this and further crises, we recommend that the following principles are kept in mind:

### 1. **Fire needs to be restored to the landscape as a core ecological process, at significant ecological scales across California.**

Fire suppression policies have created many of the problems currently faced by California’s forests. A significant increase in fire is necessary and will help address the current tree mortality crisis as well as the large patches of high severity burns (North et al. 2012). There needs to be a larger policy shift towards the goal of restoring fire to the landscape where possible, creating more balanced and ecologically appropriate fire regimes. Here are some key steps that would go a long way towards achieving this goal:

- A. **Increase community fire protection** through incentives, increased outreach, education, and/or enforcement as part of a landscape fire strategy. By supporting Firewise Communities/USA and Fire Safe community fire safety programs, we provide increased certainty that communities and structures are safe. Community fire protection makes it possible to reintroduce fire responsibly and reduces risks to communities in the wildland-urban interface. While there here has been success in locations throughout California where fuels reduction work has limited negative fire effects, the recent Butte and Valley fires (2015) clearly point to the need for increased incentives, outreach, and enforcement of fire safe policies that protect homes and communities in California’s fire-prone landscapes. We believe increased community fire awareness and protection will translate into broader fire use and greater public acceptance of fire as a key ecological process.
- B. **Improve air quality monitoring efforts** that can otherwise hinder much needed prescribed burns or managed natural fires. With better coordination between fire

managers and air quality regulators and by using the latest modeling tools and spatially explicit information about air currents, air quality monitoring can be more responsive and precise in avoiding adverse impacts on human health. Furthermore, these air quality standards could better incorporate the public health and economic tradeoffs between the potential risk of a high severity fire occurring in the absence of increased prescribed or managed fire across California's fire-dependent landscapes (Schwiezer and Cisneros 2016; Long et al. 2017 in review).

- C. **Revitalize CAL FIRE's prescribed burn program** which is an effective way to restore fire to the landscape in collaboration with federal and private partners. By implementing the prescribed burns, CAL FIRE takes on the liability can otherwise limit landowners from using fire and makes a real difference on the ground. Restoring CAL FIRE's prescribed burn program could be a valuable use of the State Responsibility Area fee fire prevention program. CAL FIRE could also help promote the use of prescribed fire more broadly by increasing standardized training and certification. This would promote increased collaborative, ecological fire use across California that places a high value on resilience and public safety.
- D. **Promote the established, multi-party Fire MOU** for prescribed and/or managed natural fire across ownership boundaries. Supporting policies that eliminate or reduce barriers to increased fire use benefits forest lands, restores ecological health, and improves resilience. Current barriers include the lack of: staff capacity and training, public education on the benefits of fire use, evaluation of the air quality trade-offs, cross-jurisdictional fire collaboration, liability relief, and nuisance law relief.

## **2. A broad range of tools should be considered to increase forest resilience.**

Too often, fire treatments are considered only in the context of fuels reduction, with mechanical thinning and prescribed burns the only management techniques considered. These are both vital tools. However, there are additional complementary forest management practices that can increase and maintain the resilience of the forest to fire and other disturbances, including:

- A. **Managing for older, larger trees.** Many research studies point to larger, well-spaced trees as the desired condition for resilient forests because this more closely mimics historic forest structure (e.g., Hurteau and Brooks, 2011). Increasing the space between trees through fuels reduction is just one part of achieving this desired forest state. It takes time for trees to grow older and larger and there need to be mechanisms in place to ensure that the forest has the time to grow into the desired state. This is especially important as it can take up to 50 or 60 years for the forest to resequence the carbon emitted from treatments (Loudermilk et al., 2016). Some progress has been made in ensuring that state-funded forest improvement work provides time for forests to grow older, such as the requirement in SB 859 (2016) that GGRF funds applied to landscape scale forest health initiatives ensure that the benefits persist for at least 50 years. All forest restoration programs

must recognize the critical role of time in restoring resilient forest conditions and include provisions to ensure the development of older trees.

- B. **Increasing diversity within the forest.** Many management techniques can increase diversity, which is a well-established way to improve resilience (Hooper et al., 2005). These techniques include (re)planting a mixture of native species, managing for a diversity of age classes within a forest from early seral to late, and using fire to create patchiness on a landscape scale. A diversity of species and ages, with some drought tolerant and others fire adapted, will help the forest continue to provide core ecosystem services. This is because, in the face of disturbance, there is a much greater likelihood in a diverse forest than even-aged homogenous plantation that some of the trees adapted to survive that particular disturbance will be present. There are also co-benefits to increased diversity, such as the improvement of wildlife habitat and the decreased risk of impaired watershed function.
  
- C. **Decrease forest fragmentation** which leads to greater fire risk to property as more human structures are located in the wild-urban interface (Theobald and Romme, 2007). These fragmented forests interlaced with human structures are a particularly challenging place to both fight the fires that endangered properties and reintroduce fires that could help restore ecological processes. Fires are also more likely to occur in fragmented forests as there is an increased risk of a human-caused ignition (Franklin and Forman, 1987). Fragmentation can be effectively reduced through funding for proactive conservation initiatives that increase landscape connectivity and by modifying (or better enforcing) local zoning laws in high and very high fire hazard areas. Coupled with increased community fire protection efforts, limitations on down-zoning in high fire risk areas would rein in skyrocketing fire suppression cost.
  
- D. **Harness disturbance to promote positive change.** Disturbances such as fire and beetle outbreaks are not always devastating and are sometimes useful in improving forest health and resilience to later events. For instance, while the beetle outbreak is dramatic, in many places it is likely to result in stand densities more appropriate to current and future climate conditions. While there are obvious public safety issues to address, we need to be careful not to assume that every instance of disturbance is inherently a natural disaster. California's forests are ecological systems that will fluctuate between a range of different conditions. Maintaining the status quo is not only impossible, but often inadvisable in light of the state's goals for resilient forests that sequester carbon, sustain wildlife habitat, and provide sources of water. Remembering root causes, including a century of fire exclusion exacerbated by advancing climate change, will help us avoid making huge ecological missteps again.

### **3. Private landowners need incentives for changes in management.**

In California's checkerboard landscape, managing forests across ownership boundaries is critical to landscape level goals such as increased resilience. State and federal agencies need to work with private landowners, NGOs, and other partners to effectively improve forest

resilience. These improvements in resilience will likely also result in better watershed function, wildlife habitat, and carbon sequestration. However, they are also unlikely to occur on private lands without some policy intervention – either carrot or stick.

Strategic use of working forest conservation easements can be an appropriate tool for both connecting forest patches to prevent additional fragmentation and to develop forest characteristics that take time. Easements provisions can outline the desired outcome for forest conditions - creating more natural forest structures, letting trees go older, and making the forest more resilient. Permanent easements are a cost-effective tool to provide private landowners with the incentive to manage their land for public benefit. These easements not only aid in climate change mitigation by increasing carbon stores and preventing development, but they also can help adaptation to climate change by improving habitat conditions, increasing habitat connectivity, and securing water supplies.

Sincerely,

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*\*these papers are attached*