

# CALIFORNIA LEGISLATURE

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## JOINT INFORMATIONAL HEARING SENATE NATURAL RESOURCES AND WATER COMMITTEE ASSEMBLY NATURAL RESOURCES COMMITTEE

### TREE MORTALITY, FOREST HEALTH, AND PRESCRIBED FIRE

#### Background

California forests are important for achieving state goals to reduce greenhouse gas emissions. Forests can be a major sequester of carbon from the atmosphere, yet forest fires also release substantial carbon emissions as they burn. Human fire suppression strategies over the past 100+ years have increased the tree density of forests, and consequently the risk of large, intense, greenhouse-gas releasing fires in California forests. The recent tree mortality crisis and drought conditions have increased this problem. Whether California forests provide a net reduction in state greenhouse gas emissions depends, in part, on the results of future forest fires, and, therefore, a focus on reducing tree density in forests is timely and important.

Prescribed and managed burning of forests is one tool that increases short-term carbon emissions in order to mitigate the risk of larger fires with higher carbon emissions in the future. For example, recent research has shown that had the land associated with the Rim Fire, a >250,000-acre fire in the Sierra Nevada in 2013, been intentionally managed for resource objectives, the impact could have been five times less. Further, the greenhouse gas emissions from the Rim Fire were substantial, releasing an amount equivalent to the annual greenhouse gas emissions from 2.3 million vehicles or 3.2 coal-fired power plants. Prescribed and managed burns provide a low to moderate severity fire alternative, that was common in the mid-elevations of the Sierra Nevada prior to fire suppression policies. Recent studies show that the Sierra Nevada is far below historic levels of low and moderate severity fire, which prescribed burning mimics. Among forest management alternatives, the use of prescribed burning and mechanical thinning as part of a comprehensive plan to enhance the resilience of forest ecosystems may provide mitigation for long-term carbon emissions and is also likely to provide ecological benefits. The

barriers to increased use of prescribed or managed fire include funding, public acceptance, liability, and air quality concerns.

One-third of California is covered in forests. These forests are composed of 57% Federal Land, including US Forest Service, National Park Service, and Bureau of Land Management portions, and 15% industrial timber lands. The remainder is made up of lands owned by individuals, corporations, and Native American Tribes totaling 25% and lands owned by California Department of Forestry and Fire Prevention (CAL FIRE), local open space, and land trusts totaling 3%. Despite a small percentage of state-owned lands, the state is responsible for fire protection on more than just land it owns. In total that land includes 31 million acres of forests, watersheds, and rangeland.

A century of fire suppression strategies across the state have contributed to an increased density of trees, but also reduced tree size. In the Stanislaus National Forest, a team of UC Berkeley researchers found a density of 400 trees per acre in 2013, compared with 60-90 trees per acre found in historical reports from 1911. In addition, the researchers found more undergrowth species, and a smaller average size of the tree than in 1911. California's history of logging has contributed to smaller tree size by removing large old growth trees. Larger trees are a more secure way to store carbon because they are more resilient to disturbances such as drought and fire.

More than 100 million trees in California have perished since the start of the drought. On October 30, 2015, Governor Brown issued a state of emergency proclamation and sent a letter to the Secretary of the US Department of Agriculture urging federal support and partnership to address the tree mortality crisis. Furthermore, Governor Brown established a tree mortality task force to address the crisis. Although the tree mortality crisis disproportionately impacts the Sierra Nevada, forests of other regions in the state, including the mountains of the Los Angeles Basin and the coastal ranges up and down the state, present similar problems because of drought, insect impacts, and disease. Therefore, the importance of logistical planning and specific coordination for managing prescribed fires is significant. The diversity of tree species, forest composition, and climate among these regions suggests that site specific prescribed or managed fire approaches are needed to make the best use of this management tool. Climate change in California will increase the likelihood of conditions that lead to tree mortality.

California's forests are not only susceptible to the effects of climate change but are also contributing to emissions. Dead, decaying, and dying trees have been shown to emit greenhouse gases, reducing the carbon storage capacity of the forests. Moreover, wildfires are now the single largest source of black carbon emissions in California, representing 66% of black carbon emissions in 2013. Black carbon or soot is a major contributor to climate change. If high severity fires, aided by drought and infestations of bark beetles, lead to large areas of forest being permanently converted from forest to shrub land, it would be a substantial loss in carbon storage, which is an important component of California's ability to achieve greenhouse gas goals.

The most recent draft of the Forest Carbon Plan released by the Natural Resources Agency and California Environmental Protection Agency states that “current rates of fuel reduction, thinning of overly dense forests, and use of prescribed and managed fire are far below levels needed to restore forest health, prevent extreme fires, and meet the state’s greenhouse gas reduction targets.” The Forest Carbon Plan calls for aggressively increasing the number of acres treated to reduce fuels. Much of the state effort for dead tree removal has focused on trees that pose a threat to public safety. There are questions as to whether the state should focus on additional removal of large dead trees that do not pose a public safety threat or on increasing efforts to bring fire back to California landscapes to create more resilient, carbon-storing forests.