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Guy McCarthy / file Butte Fire file photo

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## Wet weather doesn't mean Sierra Nevada forests are OK

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The impacts of 2013 Rim Fire and the 2015 Butte Fire on Tuolumne and Calaveras counties are used to prominently illustrate a state agency's update this month on the poor health and uncertain future of Sierra Nevada forests.

Between 2014 and 2016, an estimated 83 million trees died in the Sierra Nevada from overgrowth, bark beetles, and drought.

These are the same mountain forests that help generate more than 60 percent of California's developed water supply and are home to 60 percent of the state's animal species.

In spite of the current wet winter, forests that blanket the tallest range in the contiguous U.S. are still in a world of hurt, Jim Branham, executive officer for the Sierra Nevada Conservancy, said Tuesday in a phone interview.

"One good wet year helps with the trees that were stressed and would have died," he said.

"There are other trees that are so far gone that this winter won't help."

Scientists say that even after a wet period tree mortality will continue in the same areas for two to four years at background levels, Branham said.

"Most people expect the tree mortality trend to reverse with this winter, but by the time you hit August and September things dry out," he said.

The conservancy, created by bipartisan legislation signed into law in 2004, released on March 1 the first update to its October 2014 State of the Sierra Nevada's Forests, and they call it "From Bad to Worse."

"If we're out of the drought now, we're sure we will go back to another drought cycle," Branham said. "That's the way it is in California."

**Assessing damage**

Since October 2014, three factors have combined to create devastation in the Sierra: overgrown, unhealthy forests, two more years of extreme drought, and in 2014-15, one of the warmest winters on record, the report says.

These elements opened the door to major increases in the native bark beetle population, and led to historic tree die-offs in the southern and central Sierra Nevada.

The 2014 King Fire burned more than 97,000 acres in the Upper American River watershed. Almost 50 percent of the fire area burned at high severity, leaving little to no living vegetation behind.

The Butte Fire in 2015 burned more than 70,000 acres of the Calaveras and Mokelumne River watersheds, destroyed 549 homes and killed two residents.

Between 2014 and 2016, the Butte, King and other fires have killed 30 million trees. Sierra Nevada Conservancy staff say these numbers are unprecedented.

**Why it matters**

The Sierra Nevada is the Golden State's main water source. It's the primary source of fresh water flowing into the Sacramento-San Joaquin Delta.

In some cases, Sierra Nevada water travels hundreds of miles via the federal Central Valley Project and the California State Water Project to agricultural and urban users.

Sierra Nevada forests also store massive amounts of carbon, assisting state efforts to combat climate change. They provide critical habitat for more than 400 plants and 500 animal species, including the world's largest tree, the Giant Sequoia.

Sierra Nevada forests provide world-class recreational opportunities for millions from around the world annually. Tourism is an economic engine. According to Visit California, the state's primary marketing organization, visitors' spending in 2015 exceeded \$7.8 billion.

The Sierra Nevada range is also a major producer of timber, wood products and water force to create hydroelectric power.

"While the Sierra Nevada has been quietly providing key resources to the state for over 100 years, the declining health of Sierra forests puts all of these resources at risk," the report said.

**Unprecedented fire threat**

A century of fire suppression and conflicts over forest management have changed much of the Sierra Nevada landscape. Wildfires have become larger and more extreme over the past two decades, and the trend is expected to increase.

"There is too much fuel in many of today's forests for them to burn in a safe and ecologically beneficial manner," conservancy staff say. "The increase in size and severity of fires in the Sierra has added a new word to our lexicon: megafire."

Megafires are unnaturally large and hot compared to natural periodic fires that were part of the Sierra Nevada ecosystem for centuries before European immigrants arrived. Megafires like the 2013 Rim Fire, which burned 257,000 acres in Stanislaus National Forest and Yosemite, threaten the Sierra resources all Californians depend on.

**Rising costs**

In 2008, California spent more than \$1 billion and the U.S. Forest Service spent about \$700 million fighting fires in California.

In 2013, the Rim Fire cost \$127 million for fire suppression, \$8.5 million for emergency road, trail and watershed stabilization efforts, \$35 million for the San Francisco Public Utility Commission to buy alternative energy due to damage to hydroelectric powerhouses and for repairs to its grid, millions of dollars in losses to the ranching community as a result of destruction of grazing lands, killed livestock, and damaged infrastructure, and an estimated \$2.75 million loss in revenue from visitor lodging in Tuolumne County, according to the conservancy.

The threats of post-fire erosion in the wake of high-intensity megafires are also costly, whether hard rains hit burned slopes or not. Erosion with large amounts of sediment can destroy infrastructure, enter nearby waterways, impact water quality and decrease storage capacity in downstream reservoirs.

Unhealthy forests create a financial burden for rural communities, Sierra Nevada Conservancy staff say. Many rural communities depend on the forest for jobs and to draw visitors and tourists.

Tuolumne County budget projections showed about \$275,000 less in estimated income from tourism-driven occupancy taxes on hotels, campgrounds, and other lodging during the 2013 Rim Fire.

The 2015 Butte Fire caused more than \$1 billion in combined damages in Calaveras County. Also in Calaveras County, estimates for dead and dying tree removal over the next two to four years are between \$5 million and \$10 million.

### **Solutions**

Solutions are straightforward, according to Branham.

Federal agencies must confront overgrown, over-crowded, over-dense forests that have resulted from a century of fire suppression, mismanagement and neglect.

That means a significant increase in the pace and scale of forest thinning with methods like mechanical treatments, prescribed and managed fire, as well as meadow and stream restoration projects. There must be more coordinated investment in advanced watershed management strategies, including the Sierra Nevada Watershed Improvement Program.

Policy and process constraints must be addressed.

Conservancy staff say state and federal regulators need to identify more efficient approaches to landscape restoration planning under the National Environmental Policy Act, California Environmental Quality Act, state and federal Endangered Species Acts and other permitting processes.

This includes air quality regulations. Prescribed fire and managed fire, under appropriate conditions, are important restoration tools.

But air quality regulations, staffing, funding, and liability issues can restrict use of prescribed fire. Conservancy staff say existing policies may have the unintended consequence of enabling larger, more damaging fires and result in far more emissions than would have been released by prescribed fire.

Branham said he doesn't know where the money to pay for this comes from. Congress has underfunded the Forest Service, Bureau of Land Management and the National Park Service, for decades.

"If you don't deal with forest health and forest restoration in a proactive manner," Branham said, "taxpayers can end up paying exponentially more."

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