



Urgent action is needed in the Sierra Nevada to avoid devastating impacts on California's environment and economy.



Photo: U.S. Forest Service

The State of the Sierra Nevada's Forests

A Report of the Sierra Nevada Conservancy

The Sierra Nevada Region is an area of great significance to the State of California



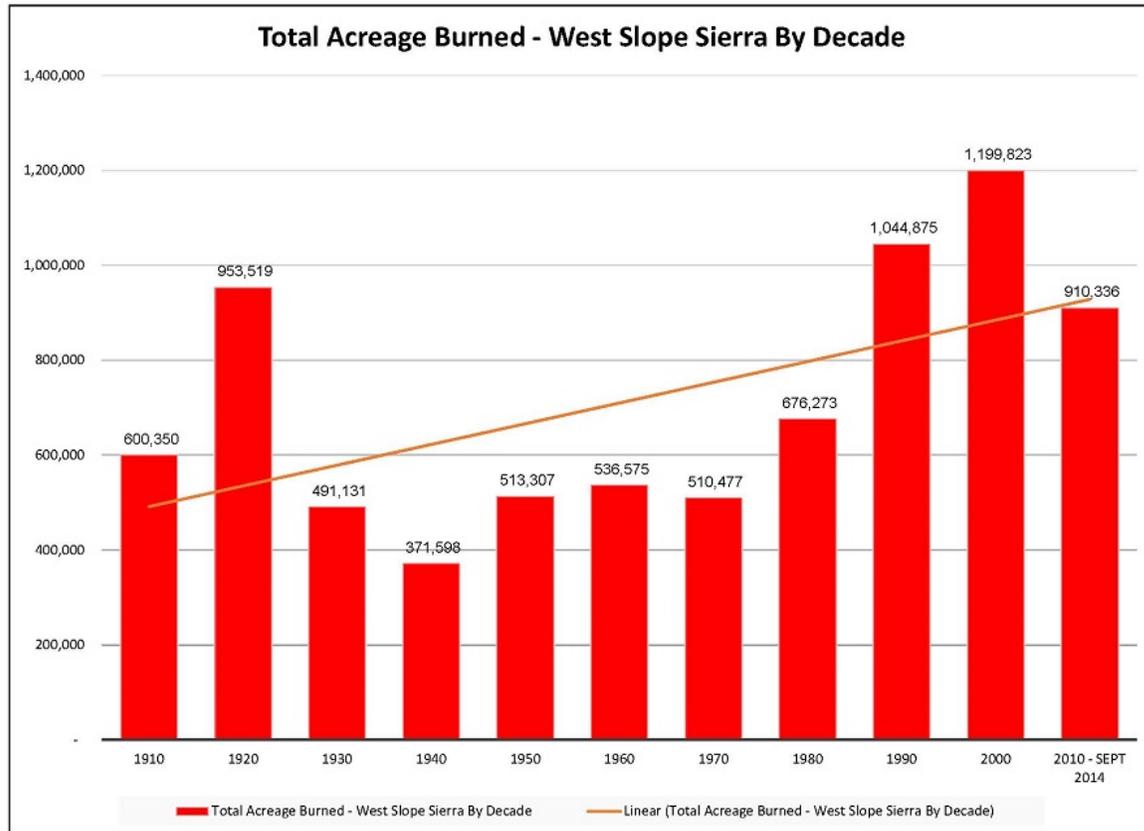
- Is California's principal watershed and is the origin of **more than 60% of California's developed water supply**
- Is the primary source of fresh water flowing into the Sacramento-San Joaquin Delta, California's water "hub"
- Stores massive amounts of carbon, assisting in the state's efforts to combat climate change
- Provides crucial habitat to hundreds of species
- Provides world-class recreational opportunities enjoyed annually by millions from around the world
- Is a major producer of wood products and hydro-electric power

Many Sierra Nevada forests are unhealthy and susceptible to disease and intense fire



- Aggressive fire suppression, conflict over forest management, and a lack of financial resources over past decades have led to a dangerous situation in many parts of the Sierra – significant areas of overgrown, diseased, dry and threatened forests.
- The unnatural conditions that currently exist mean that many fires provide fewer ecological benefits, and more ecological damage than historic fires.
- The USFS Region 5 estimates that **6 to 9 million acres** of the land they are responsible for managing in California **are in need of restoration**.
- The high cost of fighting fires has often resulted in reducing funds available for critically needed restoration efforts on federal lands.

Wildfire Threat Is Increasing



- Wildfires in California have become larger and more extreme over the last two decades and many predict that this trend will continue to increase unless the pace and scale of forest restoration dramatically increase.
- **More acres burned in the two decades of 1990 and 2000** than any other previously recorded decade.
- **More land has burned in the first four-and-a-half years of this decade** than seven entire decades in the past.
- Simply put, there is too much fuel in many of today's forests for them to burn in a safe and ecologically beneficial manner.

California's Water Supply is at Risk



- High-intensity fires can be followed by severe erosion that destroys infrastructure, impacts water quality, and decreases storage capacity in downstream reservoirs.
- High-intensity burn areas can experience runoff and erosion rates **five to ten times greater** than low- or moderate-intensity burn areas.
- Plumes of sediment entering reservoirs after post-fire rain events can impact reservoir operations until the sediment settles out to the bottom, where it reduces water storage.

Photo: Creek monitoring following the Rim Fire, U.S. Forest Service

California's Water Supply is at Risk



Before

Photo Credit: The Nature Conservancy



After

The right amount of trees can both ensure that maximum snowfall reaches the ground, while also protecting snowpack from direct sun exposure and high winds.

- When trees are too close together, **up to 60% of snowfall may get trapped in the canopy** instead of falling to the ground, making it unavailable for downstream water uses.
- However, adequate forest canopy cover remains important because snowpack in clearings melts earlier in the year due to direct exposure to sunlight and higher winds, compared to areas with a forest canopy.
- Forest management activities could lead to an increase in the snowpack, both by reducing the risk of wildfire and creating right-sized gaps in the canopy so that snow can fall to the ground but still receive enough shade to be protected.

Increased Air Pollution and Greenhouse Gas Emissions



- The Sierra Nevada Region **stores 420 million tons of carbon** within its productive forests, the **equivalent to the annual emissions of 400 coal-fired power plants**.
- Each year these forests can sequester enough additional carbon to offset the annual carbon dioxide emissions of almost **2.7 million passenger cars**.
- As wildfires burn, they release carbon dioxide, nitrogen oxide, volatile organic compounds, and particulate matter into the atmosphere.
- Public health effects range from eye and respiratory tract irritation to more serious disorders.
- One megafire can undo the carbon storage benefits these forests provide in a short period of time. For example, the **Rim Fire released greenhouse gas emissions in a few weeks equal to what 2.3 million vehicles would release in a year**.

Altering the Direction of Current Trends

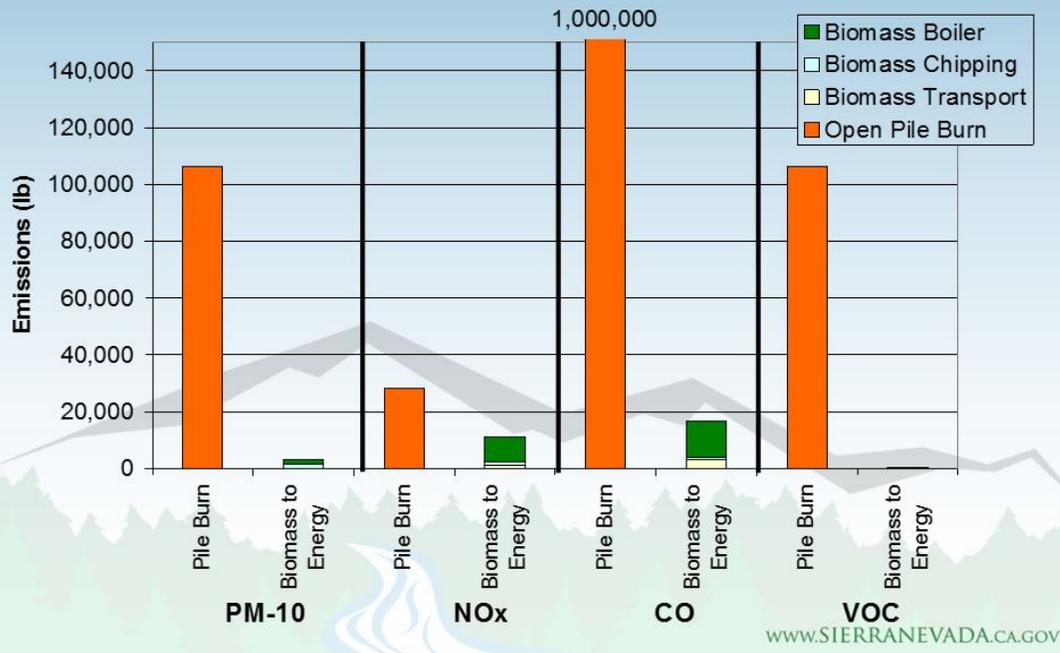


- According to the USFS, “Only an environmental restoration program of unprecedented scale can alter the direction of current trends.”
- Several high-profile statewide plans and programs identify the Sierra as an important contributor to the state’s well-being, recognize the critical state the forests are in, and call for restoration of forest health through ecologically sound forest management.
- Research currently underway further supports forest restoration by quantifying how specific activities impact the resource values Sierra forests provide.
- The dire state of Sierra forests is bringing together stakeholders who previously were in conflict with one another.

Utilizing Biomass

Air Quality Benefits

Results from biomass energy project that processed 6,800 BDT biomass from thinning project on USFS Tahoe National Forest American River District



- It is estimated that about 500,000 acres of annual restoration treatments on USFS lands would help restore the health of the forests and help keep pace with future forest growth.
- Converting biomass from forest restoration efforts into energy rather than piling and burning it **reduces greenhouse gas emissions by over 30%**.
- Several communities throughout the Sierra Nevada have launched efforts to develop biomass-to-energy facilities, but more needs to be done to address the ongoing need.

The Need to Address Impediments



Major impediments to increasing pace and scale exist, and must be addressed to the appropriate extent if we expect to make meaningful progress toward our goals. There are a multitude of challenges, but we have identified the following five as the most immediate and limiting:

- Insufficient funding and resources
- Lack of wood/biomass processing infrastructure
- Lengthy/complex planning processes
- Need for increased use of fire as a management tool for restoration
- Need to increase use of contracting tools that maximize local benefits to forest communities

We Need to Act Now!

Without bold action to increase the pace and scale of forest restoration in the Sierra Nevada, California will face ongoing adverse impacts to its environment and economy.

The alternative of continuing down the path that we are on should not be acceptable to anyone who benefits from, and cares about, this incredible piece of the California landscape.

Learn more at www.sierranevada.ca.gov

Photo: South Fork Kings River, *Friends of the South Fork Kings*

