



California's forests are in a very unhealthy state: longer fire seasons, drought, invasive species, tree mortality, warmer temperatures, and the consequences of a century of unnatural fire suppression. The result is overgrown and under-managed forests that lead to catastrophic, unnatural fires with significant negative environmental impacts.

The preponderance of science points to proactive fuel reduction projects to restore forest health and reduce the risk of catastrophic wildfire. Additionally, State and Federal policy emphasizes the need to increase the pace and scale of these projects. A collection of some of these resources is provided below.

GOVERNMENT

FEDERAL

- [Confronting the Wildfire Crisis: A Strategy for Protecting Communities and Improving Resilience in America's Forests](#) - United States Department of Agriculture (USDA)

Outlines the need to significantly increase fuels and forest health treatments to address the escalating crisis of wildfire danger that threatens millions of acres and numerous communities across the United States.

- [Future of America's Forests and Rangelands \(usda.gov\)](#) - United States Department of Agriculture (USDA)

The 2020 Resources Planning Act (RPA) Assessment summarizes findings about the status, trends, and projected future of the Nation's forests and rangelands and the renewable resources that they provide. References expected increases in total forestland area burned by wildfires and the potential benefits of forest management in mitigating climate change and reducing incidences of high-severity fires (xvi-xvii).

- [FACT SHEET: President Biden Signs Executive Order to Strengthen America's Forests, Boost Wildfire Resilience, and Combat Global Deforestation | The White House](#) - President Joe Biden

Executive Order expanding efforts to build resilience to wildfire, acknowledging importance of science-based fuels and forest health treatments.

STATE

- [California's Wildfire and Forest Resilience Action Plan: Recommendations of the Governor's Forest Management Task Force \(wildfiretaskforce.org\)](#) - Forest Management Task Force

A comprehensive strategy of the Governor's Forest Management Task Force that calls for an increase in the pace and scale of forest health projects and creating a sustainable wood products market in California, among other strategies.

- [California Ramps Up Wildfire Prevention Work | California Governor](#) - Governor Gavin Newsom

California is scaling up work to prepare, prevent, and mitigate the threat of wildfire - investing in more projects throughout the state to help protect underserved communities and stop wildfire in its tracks.

INTERNATIONAL

- [AR6 Synthesis Report: Climate Change 2023 - United Nations' Intergovernmental Panel on Climate Change \(IPCC\)](#)

The United Nation's IPCC cites sustainable forest management along with sustainably produced forest products, as key solutions to fighting climate change, instead of more greenhouse gas intensive products.

RESEARCH

FOREST TREATMENT EFFECTIVENESS

- [Burning Questions Answered: New review examines 30 years of fuel treatment effects on wildfire severity](#) - Annabelle Moore, Kimberley T. Davis, Jamie Peeler, Joseph Fargione. June 2024. USDA Forest Service's Rocky Mountain Research Station.

Compiles the results of 40 different studies, finding that forest treatments aimed at decreasing tree density and surface fuels effectively decrease the severity of later wildfires.

- [Evidence of fuels management and fire weather influencing fire severity in an extreme fire event.](#) - Lydersen JM, Collins BM, Brooks ML, et al. 2017. *Ecological Applications*.

Findings that fuels treatments and low to moderate-severity wildfire can reduce fire severity in a subsequent wildfire.

- [Fire and climate change: conserving seasonally dry forests is still possible](#) - Scott L. Stephens, A. LeRoy Westerling, Matthew D. Hurteau, et al. 2020. *Frontiers in Ecology and the Environment*.

Argues that the use of fire treatments and restoration thinning strategies, do not conflict with existing environmental objectives, but will provide numerous co-benefits, including enhanced biodiversity, increased water availability, greater long-term and more sustainable carbon storage, improved forest resilience and adaptation to climate change, and reduced air pollution.

- [Fuel treatment effectiveness in California yellow pine and mixed conifer forests.](#) - Safford HD, Stevens JT, Merriam K, et al. 2012. *Forest Ecology and Management*.

Assessment of forest fuel treatment areas in California that found mortality and fire severity were strongly reduced in treated areas.

- [Fuel treatment effectiveness in the context of landform, vegetation, and large, wind-driven wildfires.](#) - Prichard SJ, Povak NA, Kennedy MC, and Peterson DW. 2020. *Ecological Applications*.

Find evidence that strategic placement of fuels reduction treatments can effectively reduce localized fire spread and severity even under severe fire weather.

- [High Roads to Resilience](#) - Sara Nelson, Patrick Bigger, Micah Elias, and Andrew Schuldt. 2022. Climate and Community Project. In partnership with the Centre for Climate Justice at the University of British Columbia.

Lays out a roadmap for reinvestment in rural communities and landscapes by a range of stakeholders - including community nonprofits, Tribal organizations, and state and federal agencies - that can put forest restoration on the high road to a safer, more vibrant future in a warming world.

- [Roadmap for Wildfire Resilience: Solutions for a Paradigm Shift](#) - The Nature Conservancy and Aspen Institute. March 2023.

Recommendations for a more strategic and collaborative approach to wildfire resilience, formed through research and a series of stakeholder workshops. The eight themes are controlled burning; landscape-scale and outcome driven; resilient communities and landscapes; forest products; partnerships, finance, and insurance; equity and access; post-fire recovery; and technology.

WILDFIRE IMPACTS (ENVIRONMENT, HEALTH, & COMMUNITY)

- [Air Quality Life Index: 2023 Annual Update](#) - Michael Greenstone and Christa Hasenkopf. 2023. Energy Policy Institute, University of Chicago.

The Air Quality Life Index (AQLI) of the University of Chicago's Energy Policy Institute, notes that sustained exposure to wildfire smoke has contributed to twenty of the nation's top thirty most polluted counties in 2021 being in California. In the most polluted county, Plumas, the AQLI estimates that residents would gain 2.1 years of life expectancy if the region adhered to the World Health Organization's (WHO) particulate pollution guidelines.

- [Daily Local-Level Estimates of Ambient Wildfire Smoke PM2.5 for the Contiguous US](#) - Marissa L. Childs, Jessica Li, Jeffrey Wen, et al. 2022. *Environmental Science & Technology*.

Study finds increases in wildfire-driven PM2.5 concentrations over the last decade, threatening decades of policy-driven improvements in overall air quality.

- [Fire and biodiversity in the Anthropocene](#) - Kelly LT, Giljohann KM, Duane A, et al. 2020. *Science*.

Many species are threatened by an increase in fire frequency or intensity, but exclusion of fire in ecosystems that need it can also be harmful. Discusses some emerging actions and strategies to managing fire and protecting biodiversity.

- [Health and social impacts of California wildfires and the deficiencies in current recovery resources: An exploratory qualitative study of systems-level issues](#) - Rosenthal A, Stover E, Haar RJ. 2021. *PLOS ONE*.

Explores health and social issues that survivors navigate following a disaster, as well as the effectiveness and sustainability of recovery resources available to survivors.

- [High-severity burned area and proportion exceed historic conditions in Sierra Nevada, California, and adjacent ranges](#) - J. N. Williams, H. D. Safford, N. Enstice, Z. L. Steel, A. K. Paulson. 2022. *Ecosphere*.

Study finds increases in high-severity burn areas in California's Sierra Nevada range over historical averages and point to a need for greater emphasis on proactive fuel reduction and increased forest resilience.

- [Long-term health effects of wildfire exposure: A scoping review](#) - Emily Grant, Jennifer D. Runkle. 2022. *The Journal of Climate Change and Health*.

Wildfires pose a number of acute and chronic health threats, including increased morbidity and mortality. While there is less long-term health research, exposure to PM2.5 and chemicals in wildfire smoke was correlated with increased risk of cancer.

- [Particulate air pollution from wildfires in the Western US under climate change](#). - Liu, J.C., Mickley, L.J., Sulprizio, M.P. et al. 2016. *Climatic Change*

Study measures the increase in particulate air pollution from wildfire smoke, anticipating significant increases in frequency and intensity in future years.

- [Up in smoke: California's greenhouse gas reductions could be wiped out by 2020 wildfires](#) - Michael Jerrett, Amir S. Jina, and Miriam E. Marlier. 2022. *Environmental Pollution*

California's wildfire carbon dioxide emissions from 2020 were approximately two times higher than California's total greenhouse gas emission reductions since 2003. The analysis points to increased forest management investment as one intervention strategy.

- [Wildfire smoke exposure and emergency department visits in Washington State](#) - Annie Doubleday et al. 2023. *Environmental Research: Health*.

This study provides evidence of an increased risk of respiratory emergency department visits immediately following initial wildfire smoke exposure, and increased risk of cardiovascular emergency department visits several days following initial exposure. These increased risks are seen particularly among children and younger to middle-aged adults.

OTHER

- [Counteracting wildfire misinformation](#) - Gavin M. Jones, Emily K. Vraga, Paul F. Hessburg, et. al. 2022. *Frontiers in Ecology and the Environment*. ([Supporting Information](#))

An exploration of wildfire misinformation and the potential impacts on wildfire mitigation.

NEWS ARTICLES

- [Where We Stand: Forest management needs to happen at much larger scales](#) (July 14, 2023) Plumas News

An op-ed from representatives of the University of California Cooperative Extension, Plumas County Fire Safe Council, Feather River Resource Conservation District, and Mountain Maidu, emphasizing the need for large scale forest management projects in California to protect communities and meet state and federal forest restoration goals.

- [Forests Are Losing Their Ability to Hold Carbon](#) (July 26, 2023) - Scientific American (E&E News)

A new USDA report finds forests could become a major emitter of carbon by 2070. U.S. forests could worsen global warming instead of easing it because they are being destroyed by natural disasters and are losing their ability to absorb planet-warming gases as they get older.

- [What is the Health Impact of Wildfire Smoke?](#) - (October 11, 2021) UC Davis Magazine

Article highlights the research underway at UC Davis, at the time of publication, exploring the long-term potential health effects from wildfire smoke.