

Community Impacts of Prescribed Fire



This project was supported by a grant from the California Department of Forestry and Fire Prevention's (CAL FIRE) Forest Health Research Program (Agreements #8GG19803 & #8GG20801), as part of California Climate Investments. California Climate Investments is a statewide program that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas (GHG) emissions, strengthening the economy, and improving public health and the environment—particularly in disadvantaged communities.

Disclosures & Funding

No conflicts of interest

The contents of this report are solely the responsibility of the authors and do not necessarily represent the official views of the California Department of Public Health or any other agency or entity.

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Background



Photo courtesy of Jamie Ervin

Wildfire and Prescribed Fire in California

- California is facing a turning point in its relationship with wildlands and fire
- The 2020 fire season saw an unprecedented 4.3 million acres of land burn across the state
- Wildfires that blanketed much of California created smoke that was visible thousands of miles away
- **To reduce risk of wildfires and restore forest health, federal and state agencies plan to substantially scale up vegetation treatment of land including the use of prescribed fire**

Definitions



Image from CAL FIRE

Prescribed fire (or prescribed burning) is the planned and controlled application of fire to the land, under specified, low-risk weather conditions

Managed fire is a fire that starts unintentionally but is allowed to burn in a controlled manner rather than immediately suppressed

Purposes:

- Help to prevent high-intensity wildland fires by reducing the quantity and continuity of wildland fuel
- Promote other ecological benefits:
 - Forest health
 - Wildlife habitat
 - Watershed management
 - Improved rangeland, including reduction of invasive plant species

How does increased use of prescribed burns impact air quality and public health?



Public Health Impact of Prescribed Fire (“PHIRE”) Study.

Study goal: To investigate the community and public health impact of smoke exposure under several emission scenarios to guide decision-making on increasing prescribed burning

Research components

1) Smoke and exposure modeling

2) Health analysis

 3) **Community engagement**

Community Engagement in the Sierra Nevada Wildland-Urban Interface (WUI)

- What is their experience regarding smoke, symptoms, and life impacts?
- What are their knowledge, attitudes, and behavior regarding prescribed burns and wildfires?
- How can community fire-resilience and preparedness be improved?

Two-pronged approach



Listening sessions of Nevada & El Dorado county residents (virtual)

Community survey of Mariposa County residents who are medically vulnerable



Listening Sessions

El Dorado and
Nevada Counties
([Report](#) available
online)



<https://www.nevadacitychamber.com/nevada-city-things-to-do/nevada-city-tours/>

Overview of the Listening Sessions

We sought to learn:

- Community knowledge, attitudes, and perceptions of the public health impacts of prescribed fire
- Communication preferences

A total of 32 residents participated from two counties in the Sierra Nevada foothills, Nevada and El Dorado.

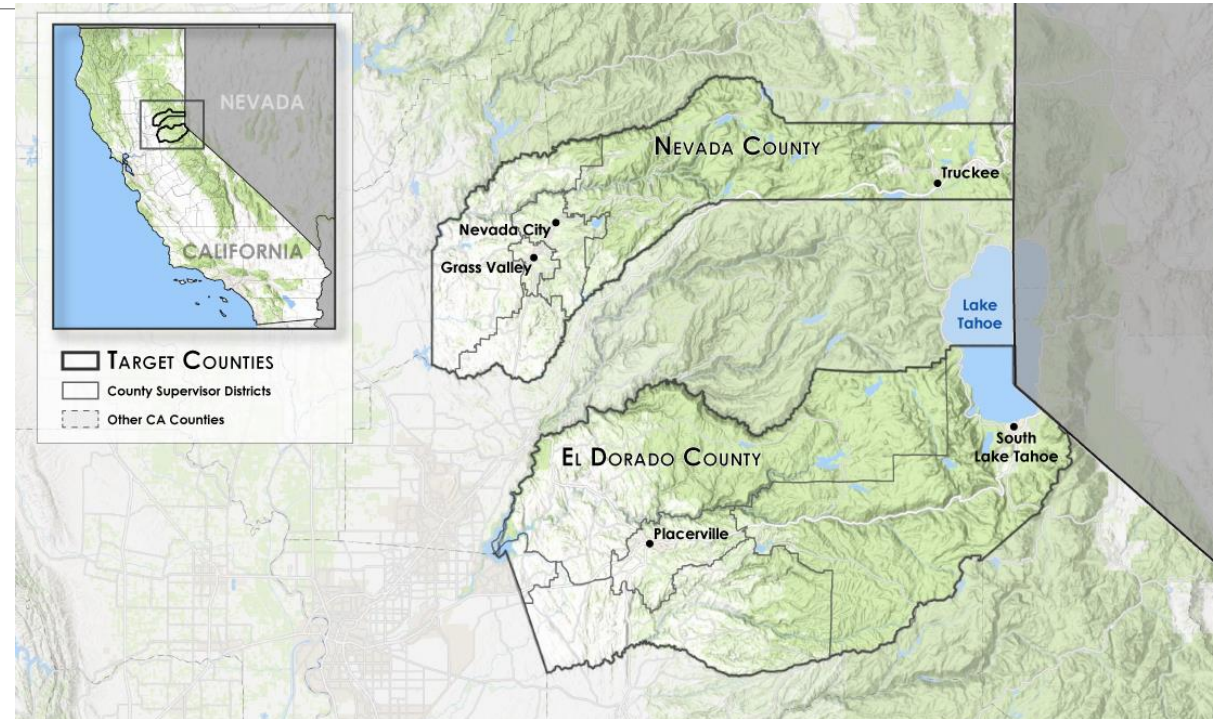


Figure 1: Map of Nevada and El Dorado Counties, location of virtual Listening Sessions, December 2 and 9, 2020, respectively.

Demographics of Nevada and El Dorado Counties

Demographic Factor	Nevada County	El Dorado County	California
Rural Population	46.4%	36.9%	6.4%
Median Income	\$66,069	\$83,377	\$75,253
Non-Hispanic White Population	85%	77%	36%
Internet Subscription Rate	89%	92%	87%

Nevada and El Dorado Counties are primarily non-Hispanic White. More residents live in rural areas compared to the California population as a whole.

Data obtained from 2019 Estimates from the U.S. Census Bureau

Recruitment of participants

Snowball/convenience method conducted by a local consulting organization

- Subjects recruited from different county supervisorial districts, varying by income levels and characteristics such as rural or town-dwelling

Participants were asked screening questions about:

- Length of time living in the county
- Education
- Political preference
- Age category
- Occupation

Some participants from the community with greater knowledge about prescribed fire and wildfire were assigned to a separate “influencers” group

Listening Session Format

Listening Sessions were held virtually, beginning with an overview in the main room

Questions were posed with feedback options:

- Speaking
- Live polls
- Chat

Participants were assigned to breakout rooms with 2 - 5 participants and a moderator

Moderators took whiteboard notes

Participants rejoined the main room and moderators summarized the breakout discussions

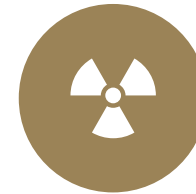
Content domains



Attitudes and concerns



Health effects and symptoms



Health- and exposure-protective behaviors



Desired information



Communication methods



Emerging themes

Findings





Most participants support prescribed fire but some had concerns.

- ▲ 100% believed more prescribed fire is needed to reduce the risk of large wildfires
- ▲ 96% support policy of managing fire for resource purposes
- ▲ 79% support policy of increased prescribed fire

- ▼ 25% were concerned about prescribed fire getting out of hand
- ▼ 21% could support it but had concerns



Participant Recommendations



Prescribed fire:

- Thoroughly plan prescribed burns to ensure safety
- Provide visible personnel when monitoring fires for reassurance
- Enable residents to get rid of green waste from their properties to reduce need for burning

Managed fire:

- Allow some wildfires to burn, provided they are identified as useful, monitored closely, and do not create a danger to people or personal property



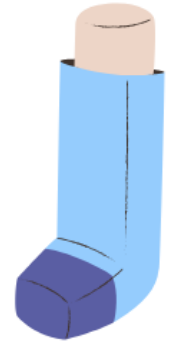
Majority have experienced health effects from wildfire smoke

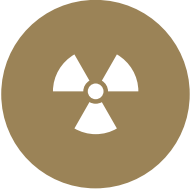
- 91% have experienced a wildfire in their area
- 73% have been directly affected by wildfires (i.e. evacuated, considered evacuating, or otherwise affected)
- 61% reported that their health has been negatively affected by smoke (either wildfires or prescribed fires)
- 72% were aware of at least one prescribed fire
- 41% have participated in a prescribed fire



Health effects of smoke impact quality of life

- ***“I have asthma, I’m asthmatic. And as long as the air quality is good, I don’t have to take my inhaler. When there are forest fires or prescribed fires, I have to use my inhaler quite a bit... However, all that being said, it’s very important for us, in my opinion, to do this. I agree that it needs to be done for the safety of many, but it really affects my health.”***
- ***“I have chest pains, have trouble breathing. I have a pulse oximeter. So it allows me to know what my oxygen saturation level is. And I have gone - believe it or not, down to 82.”***
- ***“I have not experienced the same respiratory issues that they’ve had.”***
- ***“There is trauma. Now, whenever I see a burn of any size, I call to see if we need to act.”***

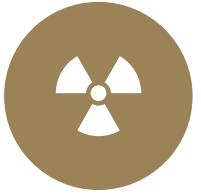




Participants faced obstacles in trying to protect their health

- Challenges in engaging in health-protective behaviors included:
 - Inability to purchase protective equipment
 - Confusion about which specific products were effective or affordable
 - Challenges in sealing their home during extended smoky periods
 - Lack of access to air conditioning





Challenges in reducing smoke exposures

- *“Actually, I am curious to learn more about those [air purifiers]. . . . I wasn't sure which ones actually work or help.”*
- *“We're staying in - we had all the doors shut and you know, try as best we can to use our filters. We don't have HEPA filters in the house. But we did keep the circulating fan on for the interior to try and keep it a little bit going through the filters. . . .”*





Participants want more information and training regarding prescribed fires

- Community-centered education about prescribed fire
 - Neighborhood festival
 - Partnership between fire agencies and local communities
- Education (and perhaps more enforcement) about air quality requirements
- Training
 - Burn classes for residents who want to learn about or conduct prescribed burns
 - Community-level training on the basics of firefighting





Desire for more information

- *“Just more information, about what exactly is a prescribed burn and how it’s done. Because I don’t know those details. And I don’t think a lot of the public does now. So that would alleviate some concerns.”*
- *“...just having like the fire department have like a fun education event...And they can do like a demo burn pile, just to kind of make it like something – with ice cream and just, you know, make it so it feels communal and fun and educational.”*





Participants want proactive, advance notification about planned prescribed fires

- At least a week's notice about planned prescribed fires
 - Details about why it may or may not occur
 - Contact information
 - What the expected air quality will be
 - Other relevant information
- More proactive notifications about prescribed fires
 - Automatic text notifications
 - Proactive robo-calls



“We thought there was a fire. . . . We didn’t know what was going on until we found out the next day that a neighbor had a burn pile. Nobody was notified.”



Communication methods could be improved to better serve residents' needs

- Consolidation of information sources into a single clearinghouse (one-stop shop)
 - Real-time updates
 - Interactive map
- Increased use of existing channels
 - Neighborhood communication systems
 - [Firewise](#)
 - [Fire Adapted Communities](#)
 - [California Fire Safe Council](#)
- Non-internet-dependent sources of information
 - Phone number to call (such as 211)
 - Physical flyers in the community
 - Television and public service announcements (PSAs)





Communication needs

- *“I do not know where to get specific information about prescribed burns.”*
- *“Well, I use Nextdoor, and it's not always accurate. And it's okay, but I would prefer going to a website that actually has the information.”*
- *“I have used a lot of these resources and I do feel like it's a patchwork.”*
- *“Some of us had difficulty getting cell service. So it's a tricky—it's a challenging problem of how do we just get the information or have a phone-in place where we can hear a recorded message. . . .”*





Equity and recognition of Indigenous cultural practices were among the emerging themes

- Equity
- Indigenous practices of cultural burnings
- Ecology/animals
- Community-level education
- Need for education – newcomers and tourists
- Managing fire for resource purposes
- Role of agencies

“So just to say that people need to be educated, and they need resources, in my opinion—they need to be able to have access to resources if they don’t have other means to protect their health during major smoke events.”

Community Survey in Mariposa County



Photo courtesy of Mariposa County Health and
Human Services Agency

Community Survey – Mariposa County

- **Support and Aid for Everyone (SAFE)**
 - Mariposa County Health and Human Services Agency program
 - SAFE individuals self-identify
 - special needs in an emergency, i.e. use wheelchairs or electrical medical equipment
 - N=106 (40%)
- **Survey:**
 - Demographics, health status
 - Attitudes, concerns regarding prescribed fire
 - Health concerns & symptoms related to wildland and prescribed fire smoke
 - Health- and exposure-protective actions
 - Requests for support/information

SAFE survey participants were older, female, and had chronic health conditions

Demographic Factor	Survey participants	Mariposa County	California
50-64 years old	20%	29%	23.9%
65-79 years old	41%	26%	15.1%
80+ years old	39%	7%	4.5%
Female	73%	49%	50.4%
20+ years in county	42%		
Hypertension	58%		
Allergies	39%		
Asthma	29%		
2 or more health conditions	61%		

Findings



Attitudes
and
concerns



Health
effects and
symptoms



Health-and
exposure-
protective
behaviors



Communication
needs



Requests
for support



Most participants support prescribed fire but some had concerns

- ▲ 69% supported policy of increasing prescribed fire
- ▲ Majority supported prescribed fires to prevent large wildfires (86%) and for ecological purposes (78%)
- ▶ 25% could support it but wanted more information
- ▼ People who have lived in the county for over 20 years were less likely to support increasing prescribed fire or managed fire

“I worry about control with these fires. Why sometimes it is done on a windy day and it gets out of control.”



Majority have experienced health impacts from wildfire or prescribed fire smoke

- 76% have been affected by wildfire
- Over half (58%) reported that their health had been affected by wildfire smoke
- 26% reported that their health had been affected by prescribed fire smoke
- 38% reported seeking care for smoke-related health symptoms
- Anxiety about smoke



“All smoke, especially that containing ash, affects my breathing”

“Several years ago, my house filled with smoke every day for 3+ weeks”



Majority took actions to protect their health but many did not feel confident in their ability to do so

- 95% took action to protect their health from smoke
- 56% took action to protect from prescribed fire smoke specifically
- Those ***satisfied with the information*** they received about prescribed fire were ***more likely to feel confident in their ability to protect their health***
- Most common actions:
 - Avoid outdoor recreation
 - Avoid daily activity
 - Stay indoors
 - Wear face mask
- 39% had knowledge of how to protect themselves but lacked confidence in being able to do so



Challenges with protecting health

- *“Being handicapped my mom has to take me to a friend’s house but only when evacuated for wildfire.”*
- *“Help for elderly with breathing problems like a place to go until prescribed fire is finished...Specifically, elderly like me with oxygen intake (daily) also need transportation.”*
- *“. . . has no radio, computers, just TV. . . .depends on a nearby family member as a caregiver to keep . . . informed.”*





Participants want more information and more reliability in sources

- 77% wanted at least one week's advance notice
- Participants wanted info on the following:
 - Prescribed fire
 - Health risks
 - Practical info on how to protect health
- Preferred news sources:
 - Shift from local sources to government sources in the future
 - Strongest desire for info from Mariposa County Public Health Department
- Preference for non-internet-dependent sources
 - e.g. library, mailings, texts





Participants want more support

- Support with vegetation management
 - Including mechanical fuel reduction methods
 - Weed clearing near town
- More year-round firefighters
- Protecting animals -> One Health
 - Livestock and pets, including how to evacuate with them
 - Wildlife that may be harmed from prescribed fire



Summary and Conclusions



Themes from both engagement approaches



Policy



Health Impacts



Communications



Majority **support** policy of increased prescribed fire

- Viewed as a critical tool to reduce risks presented by wildfires
- Prescribed fire smoke are perceived as offset by the overall benefit of reducing wildfire risk
- Concerns remain:
 - Safety measures
 - Weather conditions (drought, wind, wildfire season)
 - Health of humans, animals, and ecosystems
 - Ability to control prescribed fire

Majority have experienced **health impacts** from smoke

- Physical and mental health impacts
 - Respiratory symptoms
 - Cardiovascular symptoms
 - Anxiety
- Many become anxious when there's smoke and want to quickly know whether it's a wildfire or prescribed burn
- Participants experienced obstacles to protecting their health

Majority want more timely, practical information



At least one week's notice for prescribed burns



Authoritative, reliable source of information (clearinghouse)



Use of more non-internet sources and existing networks



Want info on health risks and how to protect themselves

"I am used to neighbors burning but large-scale events are more frightening if not forewarned."

The authors of this report would especially like to extend a heartfelt thanks to the participants in the listening sessions and the community survey for generously taking the time to share their thoughts and experiences on wildfire and prescribed fire.

Thank you!



Photo courtesy of Lenya Quinn-Davidson

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Thank you!

Questions?

Contact Sumi Hoshiko, sumi.hoshiko@cdph.ca.gov

Other publications:

Published:

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