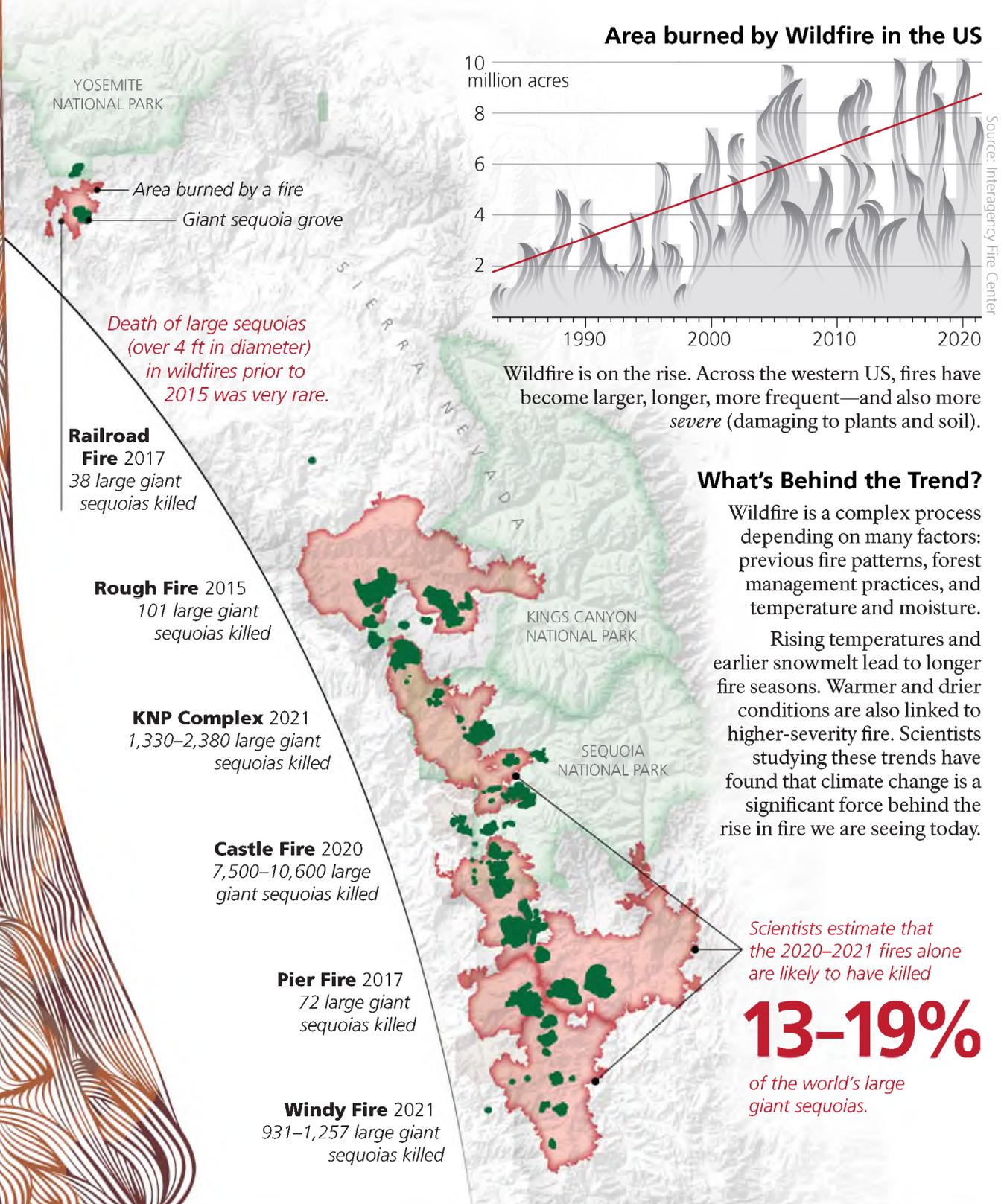


# A Burning Threat



Giant sequoias are icons of resilience, adapted to survive thousands of years in a landscape visited by regular fire. However, a shifting climate combined with fuel buildup is driving a rise in severe wildfire in sequoia groves.



YOSEMITE NATIONAL PARK  
Area burned by a fire  
Giant sequoia grove

*Death of large sequoias (over 4 ft in diameter) in wildfires prior to 2015 was very rare.*

**Railroad Fire 2017**  
38 large giant sequoias killed

**Rough Fire 2015**  
101 large giant sequoias killed

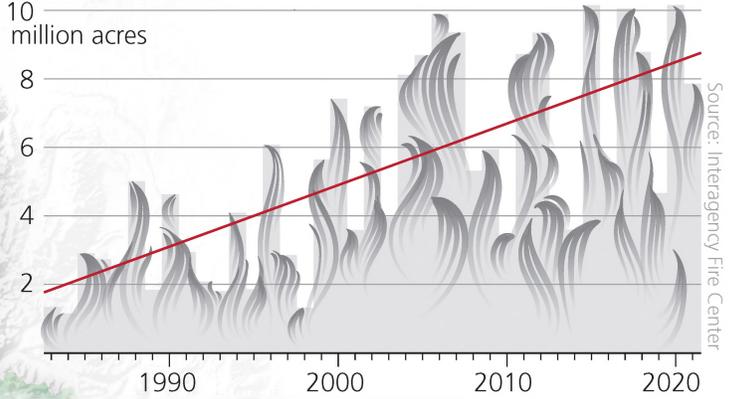
**KNP Complex 2021**  
1,330–2,380 large giant sequoias killed

**Castle Fire 2020**  
7,500–10,600 large giant sequoias killed

**Pier Fire 2017**  
72 large giant sequoias killed

**Windy Fire 2021**  
931–1,257 large giant sequoias killed

## Area burned by Wildfire in the US



Wildfire is on the rise. Across the western US, fires have become larger, longer, more frequent—and also more *severe* (damaging to plants and soil).

## What's Behind the Trend?

Wildfire is a complex process depending on many factors: previous fire patterns, forest management practices, and temperature and moisture.

Rising temperatures and earlier snowmelt lead to longer fire seasons. Warmer and drier conditions are also linked to higher-severity fire. Scientists studying these trends have found that climate change is a significant force behind the rise in fire we are seeing today.

*Scientists estimate that the 2020–2021 fires alone are likely to have killed*

# 13–19%

*of the world's large giant sequoias.*

# A Burning Threat

National Park Service  
U.S. Department of the Interior

Sequoia & Kings Canyon National Parks  
California



## Don't Sequoias Need Fire?



Yes! Sequoias grow in fire-adapted ecosystems. Periodic fires cycle nutrients and reduce fuel buildup, preventing destructive, high-severity blazes.



After over a century of fire suppression, many groves had become choked with dead wood and small trees, shading out young sequoias and creating dangerous fire conditions (1). Today, we are bringing managed fire back into the groves—

helping protect both the new generation and the old (2).



## Prescribed Fire Fuel Management

## Confronting a New Challenge

In the past, the main danger facing giant sequoia groves was logging. However, today's threats do not stop at park borders. How can we protect these trees in a time of global change?

Scientific research is an important tool to help us understand the conditions sequoias need to survive. Prescribed burns and fuel management are used to restore groves to a more resilient condition. But perhaps the most powerful defenders of sequoias are all those who learn, teach others, and take steps to create a world where sequoias can thrive for thousands of years into the future.

## Education Advocacy



## Research Monitoring

### A Mortality Mystery

Most sequoias that die in wildfires are killed directly by scorching heat and crown-burning flames.

However, several years after recent fires, scientists noticed that some trees that survived the blaze with healthy crowns were dying while still standing.

What's behind this mystery? When researchers climbed into the canopy for a closer look, they found branches riddled with *galleries* (tunnels) made by tiny cedar bark beetles. These native insects coexist with sequoias across their range, but there are no records of them killing mature trees.

The key may lie in a combination of factors. Damage related to severe fires may reduce water flow to the tree's crown. Meanwhile, the 2012–2016 drought, intensified by warmer temperatures, meant there was less water to go around. In those conditions, beetle tunneling could turn from harmless to fatal for a weakened tree.

Many questions remain unanswered. Scientists continue to work from the ground and the treetops to understand the sequoia's complex, evolving relationships with its environment.

