



Forest Service
U.S. DEPARTMENT OF AGRICULTURE

FS-1187a | January 2022

WILDFIRE CRISIS strategy



CONFRONTING THE WILDFIRE CRISIS

A Strategy for Protecting Communities and
Improving Resilience in America's Forests



TERMINOLOGY

Fireshed

Landscapes of about 250,000 acres in which an ignition can spread and expose communities to wildfire.

Forest Health

The resiliency of a forest and its ability to self-renew following drought, wildfire, beetle outbreaks, and other forest stresses and disturbances.

Fuels

Anything that can burn, including trees, grasses, dead leaves, and fallen branches.

Fuel Treatments

Various techniques to reduce the amount of fuel in a forest including thinning, prescribed burning, pruning.

Ignitions

How a fire is started. Ignitions come from lightning, campfires, and other natural and human sources.

Wildland-Urban Interface (WUI)

The private lands where homes adjoin or intersect with large areas of fire-adapted vegetation.

A CALL FOR DECISIVE ACTION

Wildfires have been growing in size, duration, and destructivity over the past 20 years. Growing wildfire risk is due to accumulating fuels, a warming climate, and expanding development in the wildland-urban interface. The risk has reached crisis proportions in the West, calling for decisive action to protect people and communities and improve forest health and resilience. It will take a paradigm shift in land management across jurisdictional boundaries to reduce risk and restore fire-adapted landscapes. In response, the U.S. Department of Agriculture, Forest Service is establishing a strategy for working with partners to dramatically increase fuels and forest health treatments by up to four times current treatment levels in the West.

The destruction 1 month after the 2017 Sonoma County wildfires. Photo provided by Adobe Stock Images.

CONFRONTING THE WILDFIRE CRISIS

Under this strategy, the Forest Service will work with partners to engineer a paradigm shift by focusing fuels and forest health treatments more strategically and at the scale of the problem, using the best available science as the guide. At the Forest Service, we now have the science and tools we need to size and place treatments in a way that will truly make a difference. We will focus on key “firesheds”—large forested landscapes and rangelands with a high likelihood that an ignition could expose homes, communities, and infrastructure to wildfire. Firesheds, typically about 250,000 acres in size, are mapped to match the scale of community exposure to wildfire.

Our new management paradigm builds on the [National Cohesive Wildland Fire Management Strategy](#), including efforts to create fire-adapted communities, and other collaborative strategies for cross-boundary treatments, including Cohesive Strategy projects and Shared Stewardship agreements. We will build on our long-standing work and relationships with U.S. Department of the Interior agencies. We will work collaboratively with States, Tribes, local communities, private landowners, and other stakeholders to adapt lessons learned into a coordinated and effective program of work. Our emphasis on fuels

reduction work to mitigate exposure and impacts to infrastructure and communities will complement and support efforts to develop fire-adapted communities.

At the Forest Service, we have set up a Wildfire Risk Reduction Infrastructure Team to build on capacity in carrying out projects. Together with partners, we will plan project areas while building community support for conducting fuels and forest health treatments. Together, we will treat the firesheds at highest risk first and, then, move on to other western firesheds, accelerating our treatments over 10 years. Next steps will include building our workforce capacity in the Forest Service and with partners to accomplish the work at the scale needed and establishing the large multijurisdictional coalition needed to support the work.

Under this 10-year strategy, we will work with partners to:

- Treat up to an additional 20 million acres on National Forest System lands.
- Treat up to an additional 30 million acres of other Federal, State, Tribal, and private lands.
- Develop a plan for long-term maintenance beyond the 10 years.

USDA Forest Service Adaptive Management Services Enterprise Team, Fire Behavior Assessment Team assistant Katharine Napier uses binoculars to observe fire behavior during Cedar Fire operations in and near the Sequoia National Forest, Posey, CA, on Wednesday, August 24, 2016. USDA Photo by Lance Cheung.



Andrew Hostad, fire prevention supervisor on the Flagstaff Ranger District, observes the Camillo Fire's success in burning off forest fuels such as the pine needles carpeting the forest floor in this area. The 2015 Camillo Fire occurred southeast of Mormon Lake, near Flagstaff, AZ, on the Coconino National Forest. Fires such as this help remove down and dead forest fuels, increasing safety for communities and lessening the threat of severe wildfires in the area. USDA Forest Service photo by Deborah Lee Soltesz.

WILDFIRE CRISIS
s t r a t e g y

+20
MILLION

Treating up to an additional 20 million acres of National Forest System lands.

+30
MILLION

Treating up to an additional 30 million acres of other Federal, State, Tribal, and private lands.

10
YEARS

Developing a plan for long-term maintenance beyond the 10 years.



The USDA Forest Service Law Enforcement and Investigations team was deployed for support after the 2018 Camp Fire swept through communities in northern California, including Paradise, Magalia, and Concow. USDA Forest Service photo by Tanner Hembree.

HOW DID WE GET HERE?

Wildfires rampaged across the West in 2021, and not for the first time. In 2020, 2017, and 2015, more than 10 million acres—an area more than six times the size of Delaware—burned nationwide. Nearly a quarter of the contiguous United States is at moderate to very high risk from wildfire. Over half of that area is in the West. In the past 20 years, many States have had record wildfires, and fires in two Western States (Alaska and California) have exceeded 1 million acres in size. In 2020, Coloradans saw all three of their largest fires on record. Fires larger than 100,000 acres have become so common that the National Interagency Fire Center has

stopped tracking them as exceptional events. “Fire seasons” have become whole fire years, with a year-round workforce for wildland fire suppression and year-round planning and fieldwork in performing postfire recovery and in preparing landscapes for future wildfires.

In short, the Nation faces a growing wildfire crisis, especially in the West. This is a national emergency, and it calls for decisive action. In response, the Forest Service is proposing a comprehensive 10-year strategy for protecting communities and improving resilience in America’s forests.

A WILDFIRE CRISIS IN THE WEST

Over the last several decades, the growing wildfires in the West only gradually reached the crisis proportions we see today. At the Forest Service, we responded by working with other land managers and policymakers. Together, we are rethinking the Nation’s approaches to wildland fire management. We have made advances in collaboration, increased funding for work to reduce wildland fire risk, and aligned actions with partners across landownership boundaries. Although the scale of the work never matched the scale of wildfire risk, we created a collaborative structure that we can build on with our partners to reduce wildfire risk.

However, annual funding for fuels and forest health treatments has been limited and uncertain, and patterns of placing treatments have never approached the scale of the needed work. Federal land managers have sized and placed their treatments based on available funding and social constraints (such as public aversion to logging or smoke) rather than on the needed location at the right scale. Treatments have been further limited by the challenge of coordinating funding and capacity to do the work across landownership boundaries.

A warning sign came in 1988 with the Yellowstone Fires, which burned much of Yellowstone National Park and adjacent national forest land on a scale not seen in decades, including almost 800,000 acres burned in the park alone. Severe fire years followed in 1994 and 1996, with growing fire sizes and suppression costs.

Then came the 2000 fire year, when 7.4 million acres burned across the Nation,

the most in at least 17 years. The Nation responded with a National Fire Plan and a 10-Year Strategy and Implementation Plan, followed by passage of the Healthy Forests Restoration Act of 2003. All were designed to increase the Nation’s capacity to restore forest health and reduce wildfire risk to homes, communities, and infrastructure. So was the Collaborative Forest Landscape Restoration Program, established by Congress in 2010. Work begun in 2008 by Federal, State, and other fire organizations led to adoption of the [National Cohesive Wildland Fire Management Strategy](#) in 2014; a strategy for restoring forest health, reducing wildfire risk, and increasing safe and effective wildfire response nationwide.

In 2018, the Forest Service launched Shared Stewardship agreements with States and other partners to reduce wildfire risk across shared landscapes. In the Omnibus Bill of 2018, Congress recognized the need for fundamental change in how the Nation approaches wildland fire management, followed by congressional testimony and “national visioning” to the same effect by Forest Service leaders and partners. After another historical fire year in 2021, Congress passed the Infrastructure Investment and Jobs Act. The new legislation invests about \$5.5 billion in lands and resources entrusted to the Forest Service, as well many of the landscapes and watersheds managed together with Federal, Tribal, State, private and other partners. The new funding will help the Forest Service invest in the workforce, establishing a new firefighter job series, increasing firefighter salary base pay, and converting more than 1,000 seasonal firefighters to permanent positions.

A California wildfire burns near a residential area at night. Photo provided by Adobe Stock Images.



2000

- **Historic Fire Year**—More than 7.4 million acres burned, the most in more than a decade.
- **National Fire Plan**—A national plan with five goals, including reducing hazardous fuels through increased funding for fuels treatments.

2001

- **10-Year Strategy and Implementation Plan**—Increased fuels treatments and implemented community wildfire protection plans. Updated in 2006.

2003

- **Healthy Forests Restoration Act**—Extended the area of fuels treatments on Federal lands.

2010

- **Collaborative Forest Landscape Restoration Program**—Funded large-scale projects nationwide to reduce wildfire risk.

2014

- **National Cohesive Wildland Fire Management Strategy**—Outlined plan for restoring fire-adapted ecosystems, building fire-adapted communities, and responding to wildfire.

2018

- **Omnibus Bill**—Provided off-budget fire funding in heavy fire years; stopped funding transfers from nonfire programs.
- **Shared Stewardship initiative**—Provided for agreements with States to work with stakeholders across landscapes to reduce wildfire risk.

2021

- **Infrastructure Investment and Jobs Act**—Provided billions for investment in our lands, helping protect communities and improve resilience in America’s forests.



Cars cross the Golden Gate Bridge as wildfires cause a smokey orange sky during the 2020 fire year in California. Photo provided by Adobe Stock Images.

WHY ARE WE IN CRISIS?

Many western landscapes are at grave and growing risk of extreme wildfire impacts due to a combination of accumulating fuels, a warming climate, and expanding development in fire-prone landscapes. Past land use practices, drought, and an overemphasis on fire suppression are also contributing factors. Each factor alone elevates the risk, but the layering of each factor on the next has increased the risk exponentially, reaching the crisis proportions we see today.

FUELS BUILDUPS

Fire needs three things to burn: fuel, oxygen, and a source of ignition. Oxygen is in the air, and sources of ignition range from careless fire use (such as untended campfires) to lightning strikes, common in the West. Lightning can set a tree or brush on fire, but thunderstorms normally extinguish the fire with pouring rain. But the climate in much of the West is so dry that rain sometimes evaporates before it hits the ground, a phenomenon known as dry lightning. Dry lightning strikes can produce dozens of wildfires across a single landscape. Driven by high winds, the fires can quickly burn together to become a huge wildfire.

So both natural and human-caused ignitions are common across the West. What about fuels?

Fuels (grasses, shrubs, trees, and other burnable materials) are almost everywhere, but they have to be dry enough to burn. Wildfires are much more common in the West than in the East because the air is normally much less humid in summer. Air that is hot and dry sucks the moisture from fuels, which include not only live green trees and shrubs but also dormant grasses, dead shrubs, dead standing trees, and fallen trees and branches. When the live and dead fuels are tinder dry, they are primed to burn. All it takes is an ignition.

Ignition sources are common, so wildland fires were also common across America before settlement by nonindigenous peoples. American Indians ignited

and managed fires to create habitat and support sustainable forests. Open landscapes with frequent ground fires supported more of the resources that native peoples needed. For example, large game such as deer, elk, and bison found more grasses and other plants to eat on prairies or in open woodlands with scattered trees than in dense forests. Frequent wildland fires kept such landscapes open, from the longleaf pine forests of the South to the oak savannas of the Midwest and the ponderosa pine woodlands of the West.

In the Northern Rockies, for example, American Indians selectively burned ponderosa pine woodlands to keep the old orange-bark trees widely spaced and free from wildfire risk. They used the sugar-rich inner bark from big ponderosa pines for food after peeling the bark away in vertical strips without harming the tree, and they used wildland fire to sustain the groves of old-growth pines.

Wildland fires in many landscapes were historically cool and low to the ground, rarely entering treetops and burning entire forests. Beginning in about 1911, Federal policy put an end to the use of ground fires to keep landscapes open. For more than a century, fuels have been building up due to a national policy of fire exclusion, sometimes called a war on wildfire. In 1935, the Forest Service adopted a policy of extinguishing all wildland fires by the morning after they were first detected. By the 1950s–60s, wildland firefighting had

become so effective that the area burned each year had fallen to a fraction of its historical extent.

The Forest Service formally abandoned its fire exclusion policy in the late 1970s, but the effects remained. Heavy fuels caused so many dangerous wildfires that tens of thousands of wildland firefighters continued to turn out each year to suppress them—and the fuels continued to grow. It became a “Catch 22” of sorts: heavy fuels needed to burn to reduce wildfire risk; but the fuels posed so much risk that most wildland fires needed to be put out, adding more fuels and increasing the risk, year after year.

Fuel buildups have now reached crisis proportions. Photographs, before and after, comparing wooded landscapes over the last century illustrate the extent of landscape change. For example, an area near Cheesman Reservoir (which supplies water to Denver, CO) shows a historical landscape that was much more open than a century later, with far fewer trees because of frequent wildland fires. Across the West, ponderosa pine forests historically had 40 to 60 trees of all sizes per acre. Today, many of these same open woodlands have become dense forests with hundreds of trees per acre, including thickets that erupt into devastating wildfires when ignited by people or dry lightning. With such heavy fuel buildups, it’s no wonder that wildfire risks across the West are so high.

Dead and dying trees add to abundant fuels, creating a wildfire hazard. Photo provided by Adobe Stock Images.



[Top] Dense forest with trees killed by bark beetles on California's Sierra National Forest in 2015. Such dead and dying trees can fuel more wildfires. USDA Forest Service Photo. [Bottom] Landscape changes near Colorado's Cheesman Reservoir over time. Frequent wildland fires historically sustained open ponderosa pine forests, but a century of fire exclusion produced dense forests. Devastated by the enormous Hayman Fire in 2002, the forests never recovered. By 2020, the landscape was dominated by shrubs. USDA Forest Service photos by Kauffman and Mark Finney. The 1896 image courtesy of Denver Water Board.



CLIMATE CHANGE

Climate change also drives the wildfire crisis by making the fuels problem worse. In turn, climate change is driven by rising carbon buildups in the atmosphere.

Carbon is essential to life. In various forms, carbon cycles through the atmosphere and through plants and animals (including humans) in natural processes. As part of the process, forests take up carbon from the atmosphere and store it in trees and soils. Wildfires, windstorms, and other forest disturbances then release the carbon into the atmosphere again; as the forest regrows, it takes up the lost carbon. The natural system is in balance.

But human activities have upset the balance. Fossil fuels—coal, oil, and natural gas—are concentrated forms of carbon stored eons ago deep underground. When people bring them to the surface and burn them for energy, they release carbon into the atmosphere additional to the natural carbon cycle.

Carbon gases in the atmosphere act as natural heat traps. Growing concentrations of carbon gases in the atmosphere from fossil fuel emissions trap increasing amounts of heat near the surface of the planet, gradually raising temperatures over time. Rising temperatures change global climates, with effects that can be hard to predict or even to attribute directly to climate change. But scientists are now certain that humans are altering climate conditions worldwide, including in the United States, through carbon emissions from fossil fuels.

In the West, climate change is making the fire and fuels problem worse by reducing snow and rainfall and by increasing the frequency and scale of high winds and hot dry weather. Beset by warmer winters, western forests increasingly lack historical snowpack levels. Higher temperatures and drier conditions reduce the ability of trees and other vegetation to take

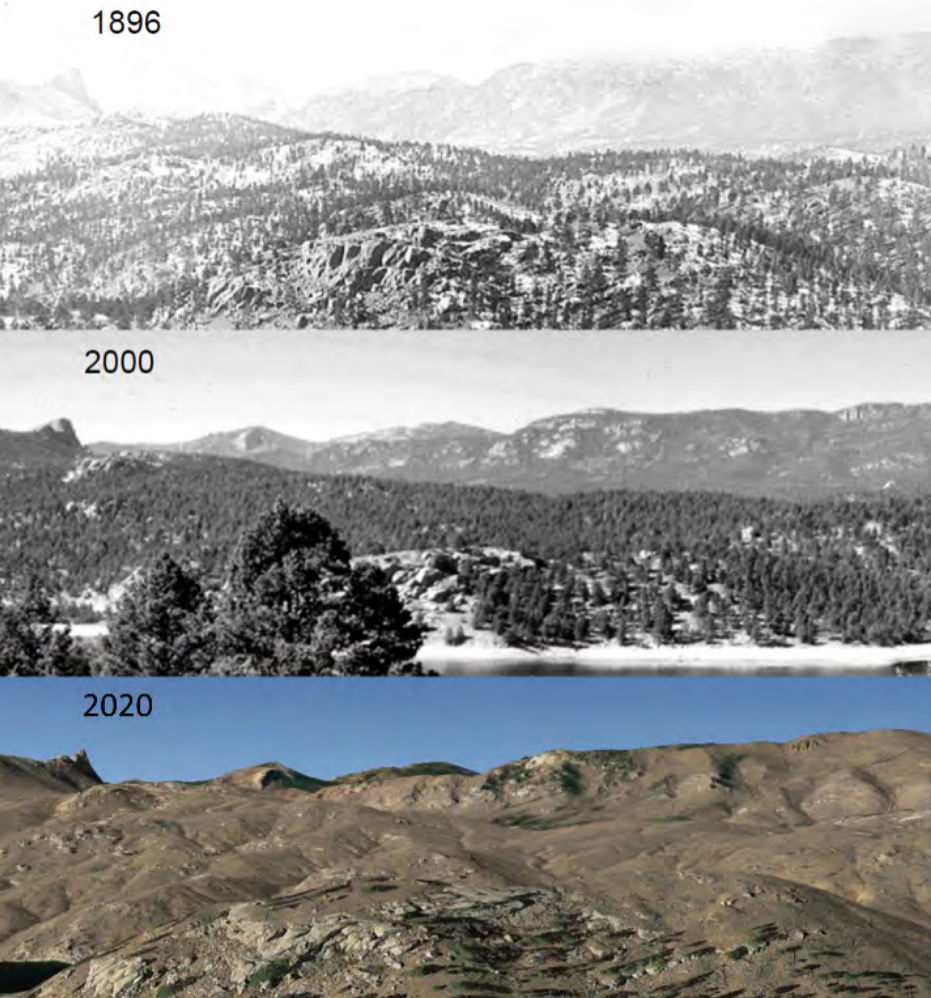
up moisture overnight, resulting in the extreme flammability of forest fuels. Since the 1990s, firefighters and fire managers have reported shocking changes in fire behavior in the course of their careers, with unprecedented fire sizes and rates of fire spread.

Moreover, harsh winters no longer suppress bark beetles—native beetles that bore into trees and, in large numbers, can kill them. With more beetles and drier conditions, more forest trees lack the sap they need to eject the beetles from their bore holes. The result has been entire landscapes of dead and dying trees across tens of millions of acres in the West. The dead and dying trees can become ready fuels for more wildfires and more extreme fire behavior.

America's forests offset climate change by taking up carbon and storing it in wood and soils, and wood products from forest logging store even more carbon. In fact,

America's forests and harvested wood products, including urban trees in cities and towns, take up almost 15 percent of the carbon dioxide that Americans emit each year.

But large and severe wildfires are threatening the ability of forests to store carbon in huge old western trees such as redwoods and giant sequoias. In 2020, for example, the Castle Fire in the southern Sierra Nevada of California destroyed 10 percent of the world's entire stock of giant sequoias. Severe wildfires, coupled with climate change, can also permanently eliminate forests from the landscape. An area of ponderosa pine forest near Cheesman Reservoir in Colorado, severely burned by the 2002 Hayman Fire, never recovered and is now dominated by shrubs. Such changes reduce the capacity of forests to store carbon, protect watersheds, and sustain critical wildlife habitat.



Aerial view of houses burned down by the 2020 Alameda Fire in southern Oregon. Photo provided by Adobe Stock Images.



WILDLAND-URBAN INTERFACE

The wildfire crisis in the West also stems from the rising risk to lives, homes, communities, and infrastructure. The risk has been growing for decades as more and more people built homes and communities in fire-prone western landscapes, especially adjacent to the national forests. The private lands where homes adjoin or intersect with large areas of fire-adapted vegetation are called the wildland-urban interface, or WUI. Layered on top of a century of fuel buildups exacerbated by climate change, WUI growth has amplified wildfire risk in the West.

The WUI has been growing since the 1960s as people built homes in wildlands or bought homes in communities with wildlands nearby. Some people moved to the WUI to enjoy the scenic beauty and a sense of seclusion; others wanted to find more backyard wildlife and more opportunities for outdoor recreation. For similar reasons, many WUI homes and communities in the West are clustered around the national forests and other public lands. One in three homes in the

United States is now in the WUI, and 70,000 communities are at risk from wildfire.

Both public and private lands in the West typically have fire-prone landscapes, putting the WUI at rising wildfire risk from fuel buildups and the effects of a changing climate. Each year, thousands of lives are put at risk from wildfires in the WUI, and scores of people have been killed in recent years. Smoke from wildfires now causes about 25 percent of all harmful human exposure to fine particulate matter (a form of air pollution) in the United States. Economic losses from wildfires have grown into the hundreds of billions of dollars each year.

Much of the rising economic loss comes from growing damage from wildfires to homes, communities, and infrastructure. By the 2000s, for example, wildfires were destroying hundreds of structures each year, mostly in the West; by the 2010s, the number was in the thousands—so high that Federal agencies began tracking the number. The running 5-year average

annual number of structures destroyed by wildfires rose from 2,873 in 2014 to 12,255 in 2020, a fourfold increase in just 6 years.

In 2018, the deadliest and most destructive American wildfire in a hundred years destroyed Paradise, a California town of 27,000 in the Sierra Nevada. The fire, called the Camp Fire, took 85 lives and burned almost 14,000 homes. Given the wildfire trajectory in the West, vast parts of the WUI are now at risk from huge fires like Camp that can sweep for 10 to 30 miles or more across multiple landownerships and forest types within days or even hours. In fact, researchers have identified hundreds of communities at higher risk than Paradise—disasters waiting to happen. Fire simulations have revealed plausible extreme scenarios that expose almost 500,000 buildings to wildfire in a single year, reflecting both the increase of people in fire-prone landscapes and the elevated scale and intensity of wildfires. If the current trajectory holds, then tragedies like the Camp Fire will not be a once-in-a-lifetime occurrence.

DEVASTATION IN FIRE-PRONE LANDSCAPES

Research shows there are hundreds more communities at risk of devastating wildfires.

2013

The Black Forest Fire near Colorado Springs, CO, killed **2** people and **destroyed 509 homes**.

2018

The Camp Fire in Paradise, CA, killed **85** people and **destroyed almost 14,000 homes**

2020

The Labor Day Fires in Washington burned almost **300,000 acres** and **largely destroyed the towns of Malden and Pine City**.

2021

The Dixie Fire in California burned almost **a million acres**, killed **1** person, and **destroyed 1,329 structures**.

HOW DOES THIS AFFECT FOREST HEALTH?

This is the new wildfire reality facing much of the West: it is nothing less than a forest health crisis. A healthy forest is resilient—capable of self-renewal following drought, wildfire, beetle outbreaks, and other forest stresses and disturbances—much as a healthy person stands a good chance of recovering from a disease or injury. Fire-adapted forests actually require frequent low-intensity wildland fire to stay healthy by keeping the number of trees and other plants in balance with scarce resources such as water, much as your own health depends on balances within your own body. Western fire-adapted forests at the lower elevations where most people live include ponderosa pine and mixed-conifer forests of pines, Douglas-fir, western larch, and grand fir.

Fire exclusion degrades such fire-adapted forests by upsetting balances in the natural system. Fuel buildups, coupled with climate change, can then alter the way a fire will behave when it inevitably returns. In overgrown ponderosa pine, for example, rather than culling vegetation

close to the ground and restoring balance to the natural system, the fire can kill most vegetation and permanently alter the ecosystem. In a way, fuel buildups are a sign of forest sickness, and a high-intensity wildfire—instead of cycling needed fire through the system—can kill it.

In the process, a high-intensity wildfire can also threaten human lives and destroy entire communities. By using existing tools like community wildfire protection plans and creating defensible spaces, people can help forested landscapes stay healthy and resilient. Through the prudent acceptance and use of the right kind of wildland fire in the right places at the right scale, communities in the WUI will support fire-adapted forests across the landscapes they share. Without major changes in the way people choose to live with wildland fire in the West, the devastation of the 2020 fire year—with more national forest land burned than in any year since 1910, including 1 million acres in a single day—will become the new norm.





A prescribed burn area near Ashley Lake, Flathead National Forest, MT. After many years of fire exclusion, an ecosystem that needs periodic fire becomes unhealthy. Trees are stressed by overcrowding, fire-dependent species disappear, and flammable fuels build up and become hazardous. Prescribed fire can help alleviate these issues by reducing hazardous fuels, protecting human communities from extreme fires, minimizing the spread of insect pest and disease, recycling nutrients back to the soil, and more. USDA Forest Service photo courtesy of Geneva Thompson.

WHAT CAN WE DO ABOUT IT?

A degraded landscape needs treatment to restore forest health, much like an ailing patient needs treatment by a doctor. Land managers can increase forest resilience and minimize wildfire impacts through forest management activities based on sound science. The activities are called hazardous fuels treatments or fuels and forest health treatments because their purpose is to reduce dangerous fuel levels and restore forest health and resilience.

From 2002 to 2013, a mountain pine beetle epidemic in north-central Colorado left half of the mature lodgepole pines dead on the Dillon Ranger District, White River National Forest. The heavy loads of hazardous fuels elevated wildland fire risk to homes and critical infrastructure across Summit County. Beginning in 2011, the Forest Service signed a cooperative agreement with partners and stakeholders across shared landscapes to escalate fuels reduction projects. The partners have contributed millions of dollars in funding for fuels reduction projects to protect watersheds, conserve forests, restore aspen, and create defensible space near communities. USDA Forest Service photo.

FUELS AND FOREST HEALTH TREATMENTS

Typically, that means reintroducing fire to fire-adapted landscapes. But using fire in forests that are overgrown and unhealthy, whether in ponderosa pine or in mixed conifer, can invite disaster. Using fire and thinning together, however, provides the best opportunity for reducing risk and moderating fire behavior. With a risk-informed approach, a forest thinning is often needed first to reduce the number of trees to something approaching the historical level a century ago. Then a low-intensity surface fire can follow—what professionals call a prescribed fire, as in a prescription that a doctor might give, only in this case it's a prescription to reduce fuels and restore forest health.

In caring for the land, there is no substitute for wildland fire in fire-adapted forests. More than a century of research has shown that low-intensity fire reduces fuels across landscapes, slowing large wildfires and diminishing their severity. To restore

forest health and reduce wildfire risk, a large multiorganizational workforce with expertise in proactive fuels and forest health management is needed for thinning forests, conducting prescribed fires, and using lightning fires and other “unplanned ignitions” to return fire to the land and restore forest health.

About half the land area of the National Forest System in the West is in wilderness areas, roadless areas, and other areas where forest thinning is restricted by law, regulation, or terrain. In these places, land managers can use prescribed fire as well as unplanned ignitions to reduce hazardous fuels and restore forest health. Most such landscapes are remote, and fires there usually have little or no impact on the WUI. However, a specialized workforce is still needed to carefully monitor the fires and put them out if they cross certain boundaries for safety.



Misconceptions and Benefits of Fire.

A PARADIGM SHIFT IN LAND MANAGEMENT

In recent decades, the Forest Service has treated up to 2 million acres per year in the West, whether through forest thinning, prescribed burning, or other means. Many fuels treatments have worked, stopping a wildfire and saving homes. In 2011, for example, the Wallow Fire—the largest in Arizona history—was bearing down on the WUI community of Alpine, roaring through tree crowns in dense ponderosa pine and threatening homes ahead. When the fire reached a treated area, it dropped to the forest floor and started crawling through ground fuels, letting firefighters safely get in and control it. Hundreds of homes were saved. Many treatments in other areas have also moderated fire behavior, buying firefighters time to evacuate people and protect homes, communities, and infrastructure. By moderating fire behavior, treatments can also ensure that a wildfire benefits a forest ecologically rather than damaging soils, habitats, watersheds, and other elements of forest health.

Unfortunately, the scale and destructivity of today's largest wildfires have far outpaced the scale of efforts to protect homes, communities, and natural resources, a trend that will only worsen as fuels become drier under the effects of a changing climate. In short, the scale of work on the ground has not matched the need, and it will take nothing less than a paradigm shift to protect the Nation's western communities.

Accordingly, the Forest Service has established a strategy for confronting the wildfire crisis by dramatically increasing fuels and forest health treatments by up to four times current treatment levels in the West. Treatments are vital in America's eastern forests as well, and the Forest Service remains committed to sustaining the health, diversity, and productivity of all of America's forests by continuing our ongoing treatment levels nationwide, including in the South, Midwest, and Northeast. The plans for accelerated fuels and forest health treatment levels include these regions as well.

Forest Service Chief Randy Moore (third from left) discusses the fuels treatments that affected the 2021 Caldor Fire, South Lake Tahoe, CA. USDA Forest Service photo by Cecilio Ricardo



However, recent decades have shown that the Nation’s greatest wildfire risk is in the West; accordingly, the focus of the new land management paradigm must be the Western United States. We need to thin western forests and return low-intensity fire to western landscapes in the form of both prescribed and natural fire, working to ensure that forest lands and communities are resilient in the face of the wildland fire that fire-adapted landscapes need.

In short, we need healthier, more resilient forests in the West. Under the new land management paradigm, the Forest Service will work with partners in the West to focus fuels and forest health treatments more strategically and at the scale of the problem, using the best available science as the guide. The work will focus on key “firesheds”—large forested landscapes with a high likelihood that an ignition could expose homes, communities, and infrastructure to wildfire. Firesheds, typically about 250,000 acres in size, are mapped to match the scale of community exposure to wildfire. In order to reduce wildfire risk to communities, forest health, and other values, science suggests that fire-adapted conditions should be restored on 35 to 45 percent of a fireshed through a range of fuels and forest management activities, including mechanical thinning and prescribed fire, followed by maintenance treatments at intervals of 10 to 15 years. Many national forests in the South and elsewhere have successful prescribed fire programs that can serve as models.

The Forest Service’s wildfire crisis strategy will target the firesheds at highest risk first—the firesheds most capable of generating large wildfire disasters and with the highest

probability of fuels reduction success. The map shows the western firesheds at highest risk of community exposure to wildfires originating on all lands. The highest priority firesheds for treatment based on community risk are in fire-prone parts of Arizona, California, Colorado, Washington, Oregon, and other Western States. The bulk of community exposure to wildfire originates from a relatively small number of firesheds in specific locations.

As the map suggests, scientists have already located the communities at highest wildfire risk and the firesheds that are the source of highest community exposure to wildfire. By targeting the source of exposure in these specific areas and working with partners and stakeholders to set common goals across shared landscapes, strategic fuels management projects can reduce wildfire impacts not only on homes and communities but also on air quality, municipal watersheds, wildlife habitat, and other values at risk. We now have a strategy for better defining where and how to place treatments within a timeframe that will truly make a difference for the communities most at risk while also restoring healthy, resilient fire-adapted forests for the future.

Science has shown that our treated landscapes need to cross jurisdictions because wildfire risk is an all-lands problem affecting multiple landownerships across firesheds.

Treatments are vital in America’s eastern forests as well, and the Forest Service remains committed to sustaining the health, diversity, and productivity of all of America’s forests by continuing our ongoing treatment levels nationwide, including in the South, Midwest, and Northeast.



Under the wildfire crisis strategy, the Forest Service envisions greatly reducing wildfire exposure in the areas at highest risk by working together with partners to:

- Treat up to an additional 20 million acres on the National Forest System in the West (over and above the current level of treatments with appropriated funds, which will continue).
- Treat up to an additional 30 million acres of other Federal, State, Tribal, and private lands in the West.
- Develop a plan for long-term maintenance beyond the 10 years.

Some projects in high-risk fire sheds are “shovel ready”—ready to go, lacking only the necessary funding to begin. The Forest Service will work with partners to identify and prioritize such projects, then launch them in years 1 and 2 of our 10-year strategy while also working with partners to build the needed workforce capacity and public support for treatments in years 3 through 10. After altering the wildfire trajectory in the most critical fire sheds, the agency will move on in subsequent years to other western fire sheds, accelerating treatments over the next 8 years.

A paradigm shift in land management calls for a corresponding shift in Federal funding. Past annual budgets for Federal land management agencies have neither resolved the forest health crisis nor diminished the

rising severity of western wildfires. We need an off-budget solution, with reliable Federal funding for the fuels and forest health projects that are highest priority under the wildfire crisis strategy. Only then can we hope to restore healthy, resilient fire-adapted forests across shared landscapes in the West.

The investments in fuels and forest health treatments will create an estimated 300,000 to 575,000 jobs, protect property values and small businesses, and stimulate local economies. In time, as we alter the trajectory of wildfire in the West, we can bring down the Forest Service’s annual wildfire suppression costs—which averaged more than \$1.9 billion per year from 2016 to 2020—and devote the funds to further restoring forest health and reducing wildfire risk in fire-adapted forests nationwide.

A new land management paradigm comes with great expectations—and with the need to hold the agency accountable for success. Preconditions for success include:

- Building workforce capacity in Federal and State agencies as well as in local, Tribal, nongovernmental, and other organizations to coordinate and accomplish the work.
- Building a large multijurisdictional coalition, including broad public and community support for the work at the scale necessary to make a difference.

Forest Service employee assess impacts of the 2021 Caldor Fire near South Lake Tahoe, CA. USDA Forest Service photo by Cecilio Ricardo.



COLLABORATIVE STRATEGY FOR ACCOMPLISHING THE WORK

Our new land management paradigm builds on two decades of collaborative work in rising to the challenge of wildland fire management. In times of crisis, Americans have traditionally joined together, rising to every challenge. Now we face the challenge of restoring forest and rangeland health and resilience by vastly expanding our collective capacity for hazardous fuels and forest health treatments. As a Nation, we already have collaborative strategies in place for cross-boundary treatments, including Shared Stewardship agreements, Joint Chiefs Landscape Restoration projects, and a network of projects under the Collaborative Forest Landscape Restoration Program.

The National Cohesive Wildland Fire Management Strategy gives us a common policy for addressing the challenge of wildland fire management through its three central goals: (1) restoring fire-adapted ecosystems on a landscape scale; (2) building fire-adapted human communities; and (3) responding safely and effectively to wildland fire. Under our new management paradigm, the Forest Service envisions full implementation of all three Cohesive Strategy components, working collaboratively through shared stewardship with States, Tribes, local communities, private landowners, and other stakeholders and as co-managers with our partner agencies at the U.S. Department of the Interior (DOI).

The Forest Service and DOI are the primary Federal organizations responsible for managing the Nation's Federal forests and rangelands. The four land

management agencies in DOI—the Bureau of Indian Affairs (BIA), the Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service (FWS), and the National Park Service (NPS)—together with the Forest Service are the Nation's Federal wildland firefighting workforce. Often indistinguishable from one another, employees from these Federal agencies work seamlessly together on the fireline. National Forest System lands and lands administered by the four DOI land management agencies frequently abut one another, and, as land management agencies, we endeavor to manage them together as one landscape. We have been partners at the National Interagency Fire Center in Boise, ID, since 1965 and together helped to co-develop the first 10-Year Strategy and the Cohesive Strategy.

Since 2002, DOI and USDA have co-chaired the Wildland Fire Leadership Council, an intergovernmental committee that supports the coordinated development and implementation of wildland fire management policy. Coordination is also occurring through the President's Wildfire Resilience Interagency Working Group (IWG), co-chaired by USDA, DOI, and the Office of Management and Budget. The IWG is bringing an all-of-Government approach to addressing the Nation's wildfire crisis, with participation and expertise from across the Administration, including the National Security Council; the Office of Science and Technology Policy; the White House Climate Policy Office; the Council on Environmental Quality; the National Economic Council; the Office of the Vice President; the



Incident command post near the Mendocino National Forest, CA. USDA Forest Service photo by Cecilio Ricardo.

Environmental Protection Agency; and the U.S. Departments of Commerce, Defense, Energy, Housing and Urban Development, Homeland Security, Health and Human Services, and Transportation.

This coordination creates new opportunities for problem-solving and allows Federal agencies to work with partners to bring additional resources to the table to address wildfire and postfire risks and protect people, communities, and natural resources. Additional collaboration will occur through the Wildfire Commission established by the Bipartisan Infrastructure Law and chaired by USDA, DOI, and the Federal Emergency Management Agency.

Through these collaborative efforts, we can restore fire-adapted ecosystems across shared landscapes by ramping up our fuels and forest health treatments in the right places at the right scale. In addition to fuels and forest health treatments, we are working together with other agencies to help support investments in fire-adapted communities and post-fire risk reduction, recovery, and reforestation. We share a commitment to consultation with Tribes and ensuring that equity is embedded in this work. Our combined efforts are a central part of addressing the climate crises and protecting areas important for ecosystem services, water, carbon, and wildlife, as well as other ecologic, economic, social, and cultural values.

By implementing projects at the scale of the actual wildfire risk, we can help communities prepare to live more safely with fire in fire-prone landscapes. For example, communities can use their community wildfire protection plans to identify areas at risk. Moreover, our

treatments at scale will help wildland firefighters respond to wildfires more safely and effectively, as happened in 2021 on the Caldor Fire in California. The Caldor Fire blew right through scattered small treatments on the Eldorado National Forest, but an area of treatments at scale on the Lake Tahoe Basin Management Unit modified fire behavior enough for firefighters to keep the fire from burning into South Lake Tahoe. The fire perimeter closely aligned with the pattern of fuels treatments around the community.

At the Forest Service, we have worked with our partners to identify projects that are ready for action. These projects include those that will reduce the risk at the right place and pace with shared investment, as well as those that need attention to equity for historically underserved communities. In the first year under the 10-year strategy, we will launch these projects, as well as focus on coordinating with State and local agencies, communities, collaborative groups, nongovernmental organizations, private landowners, Tribes, and other partners and stakeholders to build the necessary workforce capacity and coalition support for complementary cross-boundary treatments across landownerships. For example, State partners can use their State forest action plans to help identify a full range of values at risk. In subsequent years, we will continue to work with our partners to identify values at risk and establish a shared approach to reducing risk. Working together, we can reset fire-adapted western landscapes for the future through a sustained investment over the next 10 years.



Bureau of Land Management
fire crew working on a fuel
break for the Hadweenic River
Fire in Alaska. Bureau of Land
Management photo by Geoff Liesik.



FIRE-ADAPTED HUMAN COMMUNITIES

In WUI areas like South Lake Tahoe, residents and communities can take additional steps to reduce wildfire risk by making homes and infrastructure more fire resistant. Networking with neighbors and learning through social media can help. The Forest Service is working with partners to help communities write community wildfire protection plans and to help homeowners prepare for wildfires by reducing fuels on their properties and creating defensible space around their homes. Forest Service partners include Firewise, local fire safe councils, the Fire Adapted Communities Learning Network, and the Ready, Set, Go! program.

Part of creating fire-adapted communities is recognizing social diversity: a one-size-fits-all strategy will not work. For example, evidence suggests that Hispanic populations in the West are twice as likely as other demographic groups to live in the areas most threatened by wildfires. Pinpointing specific cultural communities and engaging with them about opportunities to reduce wildfire

risk will be key. The Forest Service can help gather and share local lessons while also monitoring the effectiveness of local initiatives in reducing community and homeowner risk, with a focus on continual learning.

At the core of the Cohesive Strategy is the vision of learning to live with wildland fire, which dovetails with the purpose of this new wildfire crisis strategy. In addition to creating defensible space around homes and other buildings, communities can support land managers in conducting fuels and forest health treatments at the pace and scale needed to reduce wildfire risk. Communication with people living in the WUI will be key. Through better communication, land managers can gain community support for using prescribed fire and managing unplanned ignitions to reduce long-term wildfire risks, despite short-term tradeoffs like temporary smoke in the air. Community groups can also play an active role in forest health collaboratives and in accomplishing fuels and forest health treatments across jurisdictions.

Many homes were at risk during the 2018 Taylor Creek and Klondike Fires on the Rogue-Siskiyou National Forest in Oregon. USDA Forest Service photo by Kari Greer.



A Tahoe hotshot using a drip torch during a burn operation around Camp One, Ferguson Fire, Sierra National Forest, CA, 2018. USDA Forest Service photo by Kari Greer.





WHY DOES IT MATTER?

At its core, the wildfire crisis in the West is a crisis of forest health, and protecting forest health is at the heart of the Forest Service mission—“to sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations.” Healthy forests meet basic human needs, like clean air for breathing, pure water for drinking, and opportunities for outdoor recreation and spiritual renewal.

Among other things, healthy forests store carbon and regulate natural processes such as wildland fire, building landscape immunity to its potentially devastating effects. Deprived of fire for far too long, many fire-adapted western forests are in poor and declining health. Degraded and overgrown, many are prone to disastrous wildfires that threaten lives, homes, communities, and natural resources, denying Americans the benefits they want and need from their forests.

Now we have an opportunity to restore America’s fire-adapted western forests to health and resilience through a comprehensive program of fuels and forest health treatments under the Forest Service’s new wildfire crisis strategy. This is a national emergency, and it should be treated like one by investing in treatments the way we invest in disaster response—but doing so before the disaster occurs.

The great ecologist Aldo Leopold, who started his career with the Forest Service, recognized that conservation is all about sustaining the health of the land—and that

people are part of the land, no less than soils, waters, plants, and animals. People depend on healthy, resilient forests to meet basic needs for wood, water, wildlife, and more; and our fire-adapted western forests, the forested landscapes entrusted to our care as landowners and land managers, depend on us to sustain and restore their health and resilience.

That means returning wildland fire to the land. Ironically, the wildfire crisis in the West—the excess of fuels, smoke, extreme wildfires, and lives, homes, and communities at risk—is actually a deficit of the right kind of wildland fire across western landscapes. We need a new land management paradigm across the West devoted not to shrinking the area burned each year but to making it grow through the right treatments in the right places at the right time and at the right scale.

At the Forest Service, we are committed to meeting the urgency of this moment. Building on existing relationships and creating new partnerships, we will accomplish the work in the right places and at the right pace and scale to meaningfully change the trajectory of wildfire risk to people, communities, and natural resources and restore forest health and resilience. We look forward to working with Federal, Tribal, State, local, nonprofit, and other partners. Working together, we will make a collective impact by building the multijurisdictional coalition and investing in the conditions necessary for success.

South Lake Tahoe, CA, locals cheer, yell, and blow horns to thank the firefighters for their support in protecting their homes from the 2021 Caldor Fire. The locals gathered for several days near the incident command post in South Lake Tahoe. USDA Forest Service photo by Cecilio Ricardo

NEXT STEPS: ANSWERING THE CALL

At the Forest Service, we are committed to meeting the urgency of this moment. We will build on existing relationships and create new partnerships to place fuels and forest health treatments in the right places and at the pace and scale needed to change the trajectory of wildfire risk to people, communities, and natural resources and to restore forest health and resilience. We look forward to working with Federal, Tribal, State, local, nonprofit, and other partners to build the multijurisdictional coalition needed for success.

The Sierra Hotshots captain directs crew members during a burn operation near Jerseydale on the Sierra National Forest during the 2018 Ferguson Fire in California. USDA Forest Service photo by Kari Greer.



SOURCES

Abatzoglou, J.; Williams, A.P. 2016. Impact of anthropogenic climate change on wildfire across Western U.S. forests. *Proceedings of the National Academy of Sciences*. 113(42): 114770–11775.

Ager, A.A.; Palaiologou, P.; Evers, C. [and others]. 2019. Wildfire exposure to the wildland urban interface in the Western U.S. *Applied Geography*. 111:102059. DOI: 10.1016/j.apgeog.2019.102059.

Ager, A.A.; Day, M.A.; Ringo, C. [and others]. 2021. Development and application of the fireshed registry. Gen. Tech. Rep. RMRS–GTR–425. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 47 p.

Ager, A.A.; Day, M.A.; Alcasena, F.J. [and others]. 2021. Predicting Paradise: modeling future wildfire disasters in the Western U.S. *Science of the Total Environment*. 784: 147057.

Ager, A.A.; Evers, C.R.; Day, M.A. [and others]. 2021. Planning for future fire: scenario analysis of an accelerated fuel reduction plan for the Western United States. *Landscape and Urban Planning*. November: 104212.

Barclay, E. 2019. This is a worst-possible wildfire scenario for southern California. *Vox*. 21 October.

Booz Allen Hamilton. 2015. 2014 Quadrennial Fire Review: final report. Submitted to the USDA Forest Service, Fire and Aviation Management, and the U.S. Department of the Interior, Office of Wildland Fire, Washington, DC. 79 p.

Colman, Z. 2021. Wildfires threaten all of the West—and one group more than others. *Politico*. 6 July.

Dillon, G.K.; Menakis, J.; Fay, F. 2015. Wildland fire potential: a tool for assessing wildfire risk and fuels management needs. In: Keane, R.E.; Jolly, M.; Parsons, R.; Riley, K. *Proceedings of the large wildland fires conference*. Proc. RMRS–P–73. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station: 60–76.

Graham, R.T.; McCaffrey, S.; Jain, T.B. 2004. Science basis for changing forest structure to modify wildfire behavior and severity. RMRS–GTR–120. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 43 p.

Harbour, T.; Murphy, T.; Carlile, L. [and others]. 2009. Quadrennial Fire Review 2009. Washington, DC: Fire Executive Council/National Association of State Foresters. 44 p.

Huffman, D.W.; Roccaforte, J.P.; Springer, J.D.; Crouse, J.E. 2020. Restoration applications of resource objective wildfires in Western U.S. forests: a status of knowledge review. *Fire Ecology*. 16(1). DOI: 10.1186/s42408-020-00077-x.

Intergovernmental Panel on Climate Change. 2021: Summary for policymakers. In: *Climate change 2021: the physical science basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. United Kingdom: Cambridge University Press. 41 p.

James, J.N.; Kates, N.; Kuhn, C.D. [and others]. 2018. The effects of forest restoration on ecosystem carbon in western North America: a systematic review. *Forest Ecology and Management*. 429: 625–641.

Kauffman, M.R.; Veblen, T.T.; Romme, W.H. 2006. Historical fire regimes in ponderosa pine forests of the Colorado Front Range, and recommendations for ecological restoration and fuels management. *Front Range Fuels Treatment Partnership Roundtable*. 14 p.

Leopold, A. 1942 [reprinted 1992]. Land-use and democracy. In: Callicott, J.B.; Flader, S.L., eds. *The River of the Mother of God and other essays by Aldo Leopold*. Madison, WI: University of Wisconsin Press.

Mass, C.F.; Ovens, D. 2021. The synoptic and mesoscale evolution accompanying the 2018 Camp Fire of northern California. *Bulletin of the American Meteorological Society*. 102(1): E168-E92.

Moreira, F.; Ascoli, D.; Safford, H. 2020. Wildfire management in Mediterranean-type regions: paradigm change needed. *Environmental Research Letters*. 15(1): 011001.

NASA (National Aeronautics and Space Administration). 2020. Record-setting fires in Colorado and California. NASA Earth Observatory.

National Interagency Fire Center. 2021. Wildfires and acres. Boise, ID.

North, M.; Collins, B.M.; Stephens, S. 2012. Using fire to increase the scale, benefits, and future maintenance of fuels treatments. *Journal of Forestry*. 110(7): 392–401.

North, M.P.; Stephens, S.L.; Collins, B. [and others]. 2015. Reform forest fire management. *Science*. 349(6254): 1280–1281.

Oswalt, S.N.; Smith, W.B.; Miles, P.D.; Pugh, S.A. 2019. Forest resources of the United States, 2017: a technical document supporting the Forest Service update of the 2020 RPA Assessment. Gen. Tech. Rep. WO-97. Washington, DC: Forest Service. 223 p.

Radeloff, V.C.; Helmers, D.P.; Kramer, H.A. [and others]. 2018. Rapid growth of the U.S. wildland-urban interface raises wildfire risk. *Proceedings of the National Academy of Sciences*: 115(13): 3314–3319.

Stephens, S.; McIver, J.; Boerner, R.E.J. [and others]. 2012. The effects of forest fuel-reduction treatments in the United States. *BioScience*. 62(6): 549–560.

Stephens, S.L.; Collins, B.M.; Fettig, C.J. [and others]. 2018. Drought, tree mortality, and wildfire in forests adapted to frequent fire. *BioScience*. 68(2): 77–88.

Tedim, F.; McCaffrey, S.; Leone, V. [and others]. 2020. What can we do differently about the extreme wildfire problem: an overview. In: Tedim, F.; Leone, V.; McGee, T.K., eds. *Extreme wildfire events and disasters*. Cambridge, MA: Elsevier, Inc.: 233–263.

Thompson, M.P.; MacGregor, D.G.; Dunn, C.J. [and others]. 2018. Rethinking the wildland fire management system. *Journal of Forestry*. 116(4): 382–390.

U.S. Department of Agriculture. 2021. Climate-smart agriculture and forestry strategy: 90-day progress report. Washington, DC: USDA. 15 p.

USDA Forest Service. 2020. Wildfire risk to communities.

Wildland Fire Leadership Council. 2015. The national strategy: The final phase in the development of the National Cohesive Strategy for Wildland Fire Management. Washington, DC. 93 p.

White House. 2021. Fact sheet: The American Jobs Plan. 31 March.

Wibbenmeyer, M.; McDarris, A. 2021. Wildfires in the United States: context and consequences. Washington, DC: Resources for the Future.

Williams, A.P.; Abatzoglou, J.T.; Gershunov, A. [and others]. 2019. Observed impacts of anthropogenic climate change on wildfire in California. *Earth's Future*. 7(8): 892–910.

Williams, D.R. 2017. The role of place-based social learning. In: Weber, E.P.; Lach, D.; Steel, B., eds. *New strategies for wicked problems: science and solutions in the 21st century*. Corvallis, OR: Oregon State University Press: 149–168.

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotope, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at How to File a Program Discrimination Complaint and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer, and lender.

WILDFIRE CRISIS

s t r a t e g y