

Driven by climate change, fire reshapes US West

3 September 2018, by Matthew Brown



In this Aug. 2, 2018, file photo, a tower of smoke pours from Cow Mountain as Burney, Calif., firefighter Bob May keeps a watch on surrounding vegetation for spot fires during the River wildfire near Lakeport, Calif. Wildfires that have long shaped the landscape of the U.S. West are getting bigger and burning longer – bringing more choking smoke, deadly mudslides and habitat loss. (Kent Porter/The Press Democrat via AP, File)

Wildfires in the U.S. have charred more than 10,000 square miles so far this year, an area larger than the state of Maryland, with large fires still burning in every Western state including many that are not fully contained.

Whether sparked by lightning or humans, [fire](#) has long been a force shaping the landscape of the U.S. West.

Hot, dry winds can whip flames into firestorms that leave behind charred wastelands prone to erosion and mudslides. Other fires clear out underbrush, open the forest floor to sunlight and stimulate growth.

Government agencies in recent decades effectively upended that cycle of destruction and rebirth. Fire

suppression policies allowed fuels to build up in many Western forests, making them more susceptible to major fires.

Those influences are magnified as development creeps ever deeper into forests and climate change brings hotter temperatures. Recent images of subdivisions ablaze thrust the power and ecological role of wildfires into the spotlight.

A look at the environmental effects of wildfires:

SMOKE AND RUIN

Most immediately fire brings destruction.

Temperatures from [extreme fires](#) can top 2,000 degrees Fahrenheit—hot enough to kill all plant life, incinerate seeds hidden beneath the surface and bake the soil until it becomes impervious to rain.



This Jan. 8, 2018, file photo shows standing rain water pools where a Fountaingrove neighborhood home once stood in Santa Rosa, Calif. Wildfires that have long shaped the landscape of the U.S. West are getting bigger and burning longer – bringing more choking smoke, deadly mudslides and habitat loss. Whether sparked by lightning or humans, fire has long been a force shaping the landscape of the U.S. West. (AP Photo/Eric Risberg,

File)

The lifeless landscape becomes prone to severe erosion, fouling streams and rivers with silt that kills fish and other aquatic life. Torrents of muddy debris following fires last year in Southern California killed 21 people and destroyed 129 homes.

U.S. Geological Survey scientists say the problem is getting worse as the area burned annually by wildfires increases. A study last year concluded sediment from erosion following fires would more than double by 2050 for about a third of western watersheds.

Smoke from this summer's Western wildfires—a potential health hazard for at-risk individuals—prompted the closure of Yosemite National Park for more than two weeks and drifted to the East Coast, according to NASA. Recent research says it also impacts [climate change](#) as small particles spiral into the upper atmosphere and interfere with the sun's rays.

CLIMATE QUESTIONS

Scientists broadly agree wildfires are getting bigger in North America and other parts of the world as the climate warms. But still emerging is how that change will alter the natural progression of fire and regrowth.



In this Sunday, July 15, 2018, file photo, flames from the

Ferguson fire burn down a hillside in unincorporated Mariposa County Calif., near Yosemite National Park. Wildfires in the U.S. have charred more than 10,000 square miles so far this year, an area larger than the state of Maryland, with large fires still burning in every Western state including many that are not fully contained. Hot, dry winds can whip flames into firestorms that leave behind charred wastelands prone to erosion and mudslides. (AP Photo/Noah Berger, File)

The time interval between wildfires in some locations is getting shorter, even as there's less moisture to help trees regrow. That means some forests burn, then never grow back, converting instead into shrub land more adapted to frequent fire, said Jonathan Thompson, a senior ecologist at Harvard University.

"They get stuck in this trap of repeated, high-severity fire," Thompson said. "Through time we'll see the California shrub land shifting north."

Similar shifts are being observed in Colorado, Wyoming's Yellowstone National Park and Glacier National Park in Montana, he said.

The relationship between climate and fire cuts both ways. A longer fire season and bigger fires in the boreal forests of Alaska and Canada are burning not just trees but also tundra and organic matter in soils, which hold roughly a third of the Earth's terrestrial carbon, said David Peterson, a former U.S. Forest Service research scientist.

The carbon enters the atmosphere and contributes to higher temperatures, leading to bigger fires that release yet more carbon.



This Dec. 7, 2017 photo by NASA astronaut Randy Bresnik from the International Space Station shows smoke from California wildfires. Wildfires in the U.S. have charred more than 10,000 square miles so far this year, an area larger than the state of Maryland, with large fires still burning in every Western state including many that are not fully contained. Whether sparked by lightning or humans, fire has long been a force shaping the landscape of the U.S. West. (Randy Bresnik/NASA via AP)

This Aug. 3, 2018, photo by European Space Agency astronaut Alexander Gerst aboard the International Space Station, provided by NASA, shows smoke from California's Carr and Ferguson fires blowing eastward across the western United States. Wildfires in the U.S. have charred more than 10,000 square miles so far this year, an area larger than the state of Maryland, with large fires still burning in every Western state including many that are not fully contained. Whether sparked by lightning or humans, fire has long been a force shaping the landscape of the U.S. West. (Alexander Gerst/ESA/NASA via AP)

BIRD IN THE BALANCE

Life and property still top the list of priorities for firefighters, but in recent years another asset has been deemed worth extra protection in many Western states: a chicken-sized bird known as the [greater sage grouse](#).

Fires burned an estimated 3,240 square miles (8,390 square kilometers) of the bird's sage bush habitat in 2017 and have burned almost 2,400 square miles (6,215 square kilometers) so far in 2018.

When sage brush burns, it's often replaced with a plant from Europe called cheatgrass, which crowds out native plants and is more prone to burning.

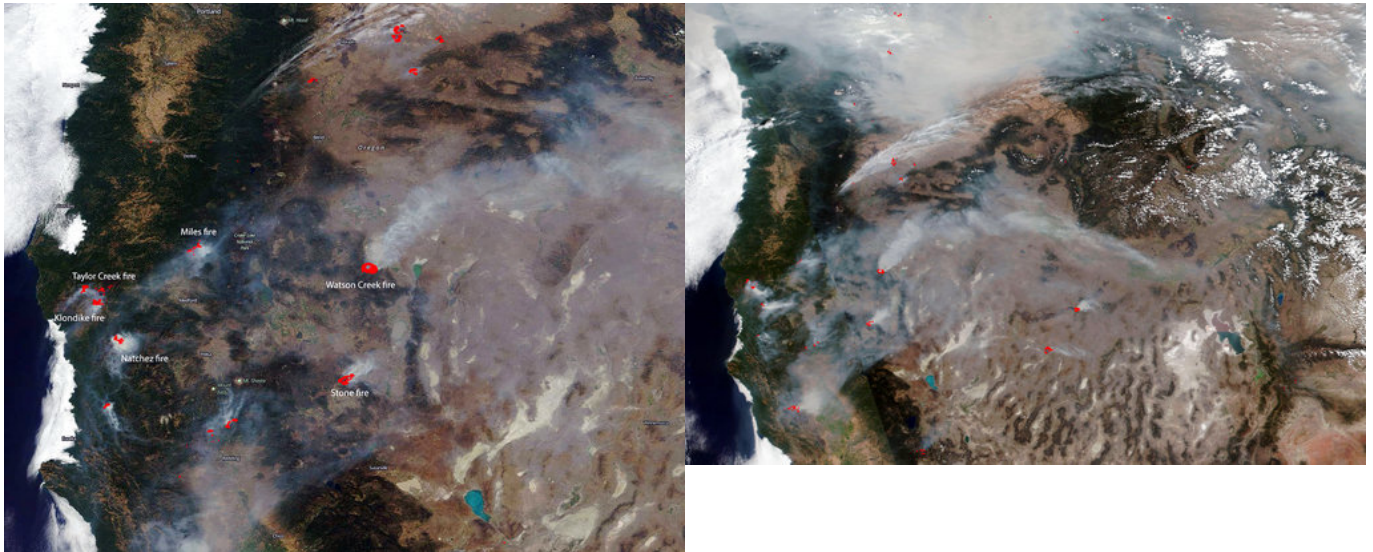
That's challenging government efforts to keep greater sage grouse off the endangered species list, which could restrict economic development.

Areas considered crucial to the bird's survival now get extra attention: A military-type Blackhawk helicopter is under government contract to deploy quick-reaction teams to snuff out sage brush fires in portions of Idaho, Nevada, Utah and Oregon.

REGENERATION

A turning point in public understanding of the ecological importance of fire came in 1988, when 1,240 square miles (3,200 square kilometers) of Yellowstone National Park burned.

The devastation, punctuated by images of wildlife fleeing flames, fed into the perception of [wildfires](#) as a menace to be battled.



This NASA satellite image posted Aug. 20, 2018 shows several of the larger wildfires in both Oregon, top, and California. Wildfires in the U.S. have charred more than 10,000 square miles so far this year, an area larger than the state of Maryland, with large fires still burning in every Western state including many that are not fully contained. Whether sparked by lightning or humans, fire has long been a force shaping the landscape of the U.S. West. (NASA via AP)

This image posted by the National Oceanic and Atmospheric Administration (NOAA), released by NASA, on Aug. 20, 2018, shows Western states, California at left, shrouded in smoke from the more than 100 large fires, including smaller fires within each complex of fires, that have erupted across the region during this fire season. Wildfires in the U.S. have charred more than 10,000 square miles so far this year, an area larger than the state of Maryland, with large fires still burning in every Western state including many that are not fully contained. Whether sparked by lightning or humans, fire has long been a force shaping the landscape of the U.S. West. (NOAA via AP)

The events drew criticism of the park's "let it burn" policy. Officials didn't immediately squelch lightning-caused fires that June because they did not pose an immediate threat to life or property, but eventually ended up deploying 10,000 firefighters.

Several species of woodpeckers thrive on insects attracted to fire-killed trees. A plant called fireweed is specially adapted to take root in fire-damaged soils, multiplying rapidly and forming carpets of pink petals against a blackened backdrop.

By that fall, seedlings already were emerging in some burned out areas. Park biologist Roy Renkin recalls a visitor reacting with surprise a decade later when he told her a thick stand of young trees emerging from a burned area had come back on their own.

"It's isn't all death and destruction," Renkin said. "These forests have evolved with fire."

Lodgepole pines are commonly cited as an example of forest resiliency. The fire's heat releases seeds from the pine's cones.

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