

Forests on Fire

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LEVELED BOOK • V

Forests on Fire

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Written by Karen Mockler

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Glossary

acres (<i>n.</i>)	a standard measure of land area equal to 4,840 square yards; an area slightly smaller than a football field (p. 4)
adapted (<i>adj.</i>)	adjusted to new or particular conditions (p. 11)
climate change (<i>n.</i>)	the long-term, lasting changes in Earth's weather patterns or the weather patterns of a region (p. 13)
cycled (<i>v.</i>)	went through a repeated series of events (p. 11)
debris (<i>n.</i>)	scattered pieces of something that are left after the rest has been destroyed or is gone (p. 12)
devastation (<i>n.</i>)	great damage or destruction (p. 5)
ecosystem (<i>n.</i>)	a community of living things together with their habitat (p. 12)
embers (<i>n.</i>)	pieces of wood or coal from a fire that glow with heat (p. 5)
invasive (<i>adj.</i>)	related to moving into a new area or body with harmful or disruptive effects; not native (p. 10)
reproduce (<i>v.</i>)	to make offspring that are similar to the original living thing (p. 11)
stewardship (<i>n.</i>)	the management of something in a protective and responsible way by a caretaker (p. 9)
wildfire (<i>n.</i>)	a fire that spreads very quickly in forests or other wild areas. (p. 5)

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Title page: A firefighter uses water to help put out the 1988 Yellowstone fire in Wyoming.

Page 3: During the 1988 fire in Yellowstone National Park, 44.5% of the park's 2.2 million acres burned. Outside the park, 420,000 acres burned.



Visitors to Yellowstone can witness the natural cycle of trees growing out of the ashes of the massive fire in 1988.

Rethinking Fire

When a wildfire burns, it's hard to remember that something so destructive is also so productive. Yellowstone is living proof that it is.

After the 1988 Yellowstone fire, dead gray stands of lodgepole pines covered the mountains for miles. Today, those trees' seedlings form lush stands of young trees that grow taller every year. Someday, their offspring will do the same—thanks to fire.

Wildfire serves a role in nature. People need to consider that role. In some cases, we might do well to stand back and let the fire do its work.

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Too Many People

So why not let some of these fires burn?

In some remote places, that's possible. The trouble is, there aren't as many remote places as there once were because people keep moving in. Since 1990, areas near U.S. wildlands are being developed at a rate of 2 million acres per year. That's about three acres per minute. Between 1990 and 2008, 10 million homes were built in U.S. wildlands near urban areas. Many are at high—or very high—risk of wildfire.

It's no surprise, then, that more homes are burning. In the 1960s, about 200 homes a year were lost to wildfires. By the 2000s, an average of 2,700 homes burned in wildfires each year. In California alone, wildfires destroy an average of 700 homes every year. That state spends \$165 million each year on homes lost to or damaged by wildfire. California spends millions more trying to keep those homes from burning in the first place.

Letting fires burn near these homes is risky. Yet we now know that it's also risky if none of these fires are allowed to burn.



A home in Santa Barbara, California, is threatened by an approaching wildfire in 2009.

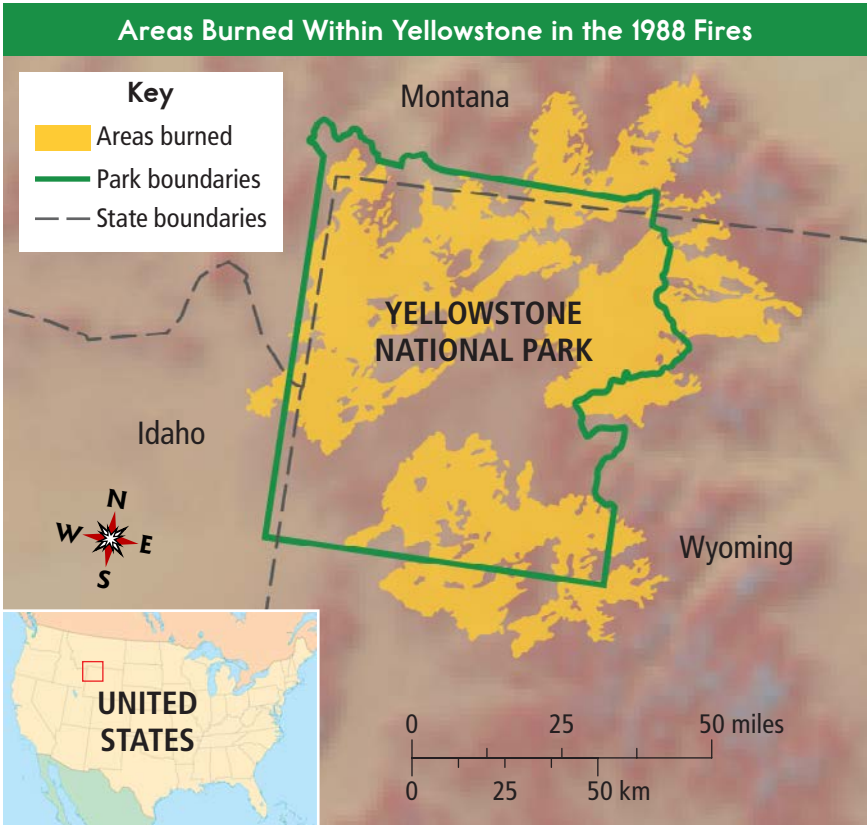


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The 1988 Yellowstone fires set two world records. They were the most expensive, costing taxpayers \$120 million; and they burned the most acres in a single day—165,000.

Yellowstone on Fire

Yellowstone is America's oldest national park and one of its best loved. With its hot, dry summers and close-packed lodgepole pines, the park is no stranger to forest fires. Until 1988, the park's largest fire on record covered 25,000 acres. At more than 2.2 million acres, Yellowstone is big enough to handle such fires now and then.

During the summer of 1988, though, the park saw a set of huge fires. Most of the fires were started by lightning. Careless people started others. Some fires started in forests outside the park and burned their way in. Firefighters tried to control the fires caused by people from the start, but other fires were allowed to burn.

Then on July 14, winds up to 80 miles per hour (129 kph) swept in. Many park visitors were ordered to leave. In their place, 25,000 firefighters from all over the country came in to fight the fires.

Many severe forest fires have burned across the West in recent years. While other factors, such as **climate change**, have also played a role, most forest experts agree that these severe fires are caused by too much fuel on the ground—and stamping out so many wildfires is to blame.

Fighting fires is also expensive. Since 1960, the annual cost to federal, state, and local governments to fight wildfires has grown from less than \$100 million to more than \$3.3 billion. This huge expense takes money away from programs that clear trees and brush in high-risk areas—programs that would prevent, or at least reduce, the scope and severity of fires.



Firefighters may spray a fire with water, do controlled burns, or clear plants to create a break in the fire.



Fire removes undergrowth to allow light to reach the forest floor and foster the growth of new plants.

Too Much Fuel

Many people can find it hard to adapt to fire. Everyone knows fire is dangerous and can cause great damage. People's view of the forest can vary greatly. Some may see the forest only as a source of wood, grass for cattle grazing, or a beautiful spot to pitch a tent—not as an **ecosystem** that sometimes needs to burn. Viewed that way, it seems only logical to put out forest fires. Yet not letting fires run their course can cause a problem for forests and people alike.

Without fire, needles, brush, and logs build up over time. Once a fire does start, the built-up **debris** on the forest floor causes the fire to become more severe. Too much fuel can make a fire almost impossible to control.

Yet the fires were just getting started. Every afternoon, high winds sent **embers** high into the sky. They landed and started more fires. On August 20, fierce winds caused 165,000 acres to burn in just one day—a day that came to be known as Black Saturday.

Firefighters fought the flames for nearly two months. By September 11, rain and early snow finally came to the rescue, dampening fires that thousands of firefighters could not. By then, 44.5 percent of the park had burned. Including the forests surrounding the park, 1.2 million acres—an area nearly the size of the state of Delaware—had burned.

Do You Know?

One square mile equals 640 acres. The 1.2 million acres that burned in 1988 are equal to 1,875 square miles (4,856 square km).

Viewing the **devastation**, many observers criticized the park's decision to let the natural fires burn. They described the park as "ruined."

Those fires raised many questions. Was Yellowstone ruined? When does it make sense to let a **wildfire** burn? Does a wildfire serve any purpose except to destroy?

Costs of Fire

Forest fires are often destructive and sometimes deadly. In the case of severe forest fires, superheated gases can reach 1,600°F (871°C). Blasts of heat have cracked boulders in half and melted chainsaws.



Types of Fire

There are three types of forest fires: ground fires, surface fires, and crown fires. A ground fire travels low to the ground and sometimes underneath it. It feeds on ground fuel and rarely shows a flame. You might walk right over it and not even know it's there.

A surface fire stays low but burns hotter, burning trees and brush. When it grows fierce enough, it turns into a crown fire.

Crown fires are the big fires. They can travel 10 miles (16 km) per hour. Flames can reach up to 300 feet (91 m).

A single forest fire can include all three types of fires.

For thousands of years, fire has been one of the forces that have shaped certain forests—not just lodgepole forests, but other kinds as well. Fire burns the forest here and there until it has **cycled** through the entire landscape. Burned areas become grassy meadows that eventually grow new trees. Together, these different areas create a system of food and shelter for many species. Different forests complete this cycle in different spans of time. One type of forest might take a thousand years, while another type may only take a hundred years.

In these forests, many plant species are **adapted** to fire. The very trees that burned in Yellowstone offer a great example because some lodgepole pines need fire to **reproduce**. Fire allows the pinecones to open and release their seeds. Without fire, the cones just sit and wait.

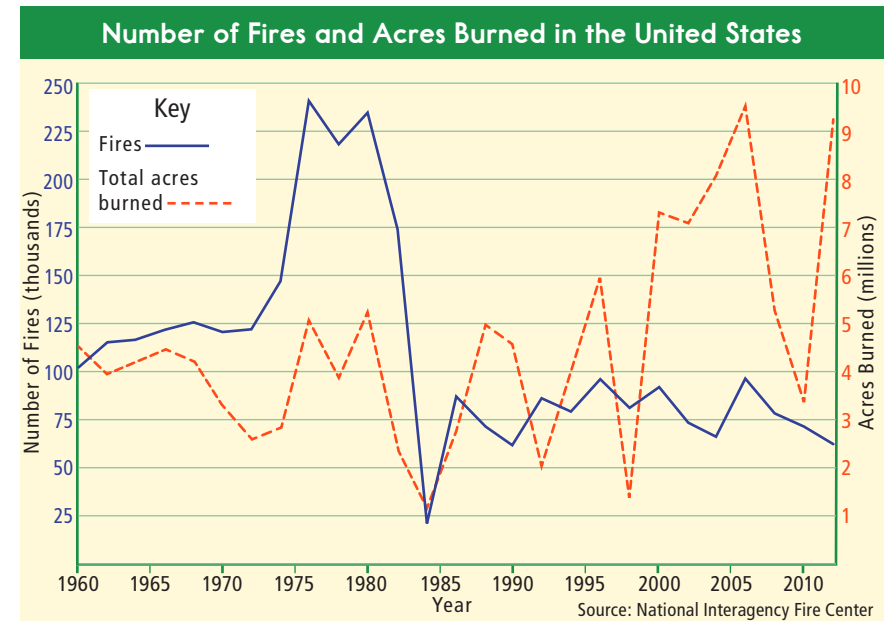
Within a month of Yellowstone's 1988 monster fire, snow covered the park. When the snow melted the following spring, it watered the roots and seeds that had survived underground. Nutritious grasses sprouted from the charred earth, attracting elk and deer. Wildflowers bloomed the next spring and summer. As it turned out, the burned park wasn't ruined after all.



Jeff Henry holds a picture he took during the 1988 Yellowstone fire. He's standing by new trees in 2008 in the same spot where he took the photograph of the historic fire twenty years before.

Adapted to Fire

Actually, many forests are equipped to survive forest fires. In fact, fire often benefits the native plants and animals in these forests. Fire fights **invasive** plants and kills harmful insects. Ash from the burned plants, which is rich in nutrients, dissolves back into the soil. Fire can improve habitat for wildlife by replacing dark, crowded stands of trees with open, sunny vistas and helping grass grow, which provides food for animals.



Recently, although the number of total fires in the United States has decreased, the total number of acres burned has increased.

In five to fifteen minutes, a fire can release as much energy as an atomic bomb.

Less severe fires can destroy property, homes, and the lives of humans and other animals. When fire has burned the plants that hold the ground in place, the landscape becomes more vulnerable to flooding and landslides. Smoke from big fires causes pollution and breathing problems. Even hundreds of miles away, the sky turns brown and smells of smoke.

Nationwide, wildfires burn millions of acres each year. The United States spends more than \$1 billion to fight them.

Do You Know?

Lightning strikes 8 million times around the world each day. Every year in the United States, lightning is the cause of an estimated 17,400 fires.

Causes of Fire

In the United States, the western region has the most forest fires. This part of the country has many forests and hot, dry summers during which lightning is common. Lightning is the leading natural cause of wildfires.

People start many forest fires, too, but usually not on purpose. Many are accidents, possibly started by a campfire that wasn't put out properly. Some are even less direct, such as a spark from a passing train's wheels igniting dry grass or nearby woods.

Most fires go out by themselves. Usually only a few acres burn, and some of those fires never even touch trees. Of course, a few fires grow huge.

Early firefighters in South Dakota use sand to manage a fire. Sand can put out a fire, help slow it down, or stop it from spreading.



People and Fire

Forest fires are nothing new, but attitudes toward them have changed over time. The Europeans who settled the West in the 1800s fought them at every turn. Until then, fires and forests had managed to find a balance. Nobody fought the wildfires, in part because nobody owned the forests.

When Yellowstone became a national park in 1872 and for a long time after, both visitors and the people who ran the park continued to see fire as destructive. The early caretakers of national parks and forests thought that putting out fires was just good **stewardship**. In 1935, the U.S. Forest Service established a rule about putting out all fires the day after they started.

This all sounded sensible at the time. After all, putting out fires protects the forest. Right?