

# Yellowstone

## *Fire As a Natural Force*

Yellowstone National Park  
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[www.nps.gov/yell](http://www.nps.gov/yell)



### Science and Fire

Scientists have been studying the role of fire in Yellowstone since the mid-20th century. Through fire research and fire history studies, park managers now understand fire is a necessary natural force. For this reason, fire management policy allows many lightning-caused fires to burn without suppression.

### Fire in Yellowstone

Fires are a natural part of the Northern Rockies ecosystem. Fire promotes habitat diversity by removing the forest overstory, allowing different plant communities to become established, and preventing trees from becoming established in grassland. Fire makes minerals more available to plants by releasing these nutrients from wood and forest litter and by hastening the weathering of soil minerals. This is especially important in a cold and dry climate like Yellowstone's, where decomposition rates are slower than in more hot and humid areas.

Examples of vegetation adapted to fire:

- Older Douglas-fir trees have thick bark that resists damage by ground fires. Look for scattered, fire-scarred trees among dense Douglas-fir stands in the valleys of the Lamar and Gardner rivers.

- Lodgepole pines produce two types of cones, one of which opens after being heated to at least 113°F. Fire-dependent cones—called serotinous—ensure seedling establishment after a fire. Lodge-pole seedlings also need an open canopy that allows plenty of sun through. This happens only if mature trees in a lodgepole stand are periodically thinned by disease, fire, or other natural agents.

Fire suppression increases forest size, diminishes plant diversity, and changes plant community structure and composition. Species susceptible to fires become prominent; diseases spread over greater areas; litter and deadfall accumulate; and minerals remain locked up or are released more slowly.

### Yellowstone Fire Facts

- Large fires burn through Yellowstone's lodgepole pine forests every 150–300 years and through grasslands every 25–60 years.
- Plants in the park, such as lodgepole pine and aspen, are adapted to fire.
- Each year, lightning starts an average of 22 fires.
- 80% of naturally started fires go out by themselves while less than an acre in size.
- Suppressing fires allows fire-sensitive plant species to flourish, which can reduce the variety of fire resistant plants in an ecosystem.
- Until the 1970s, park managers believed they had to extinguish fires to preserve park resources.
- Between 1972 and 2005, natural, un-suppressed fires burned about 66,000 acres, most during the dry years of 1979, 1981, and 1988. (Early in 1988, natural fires were allowed to burn; but all were suppressed after mid-July.)
- The 1988 fires brought management changes and new opportunities for research (see other side of this sheet).

### Suppressing Fire

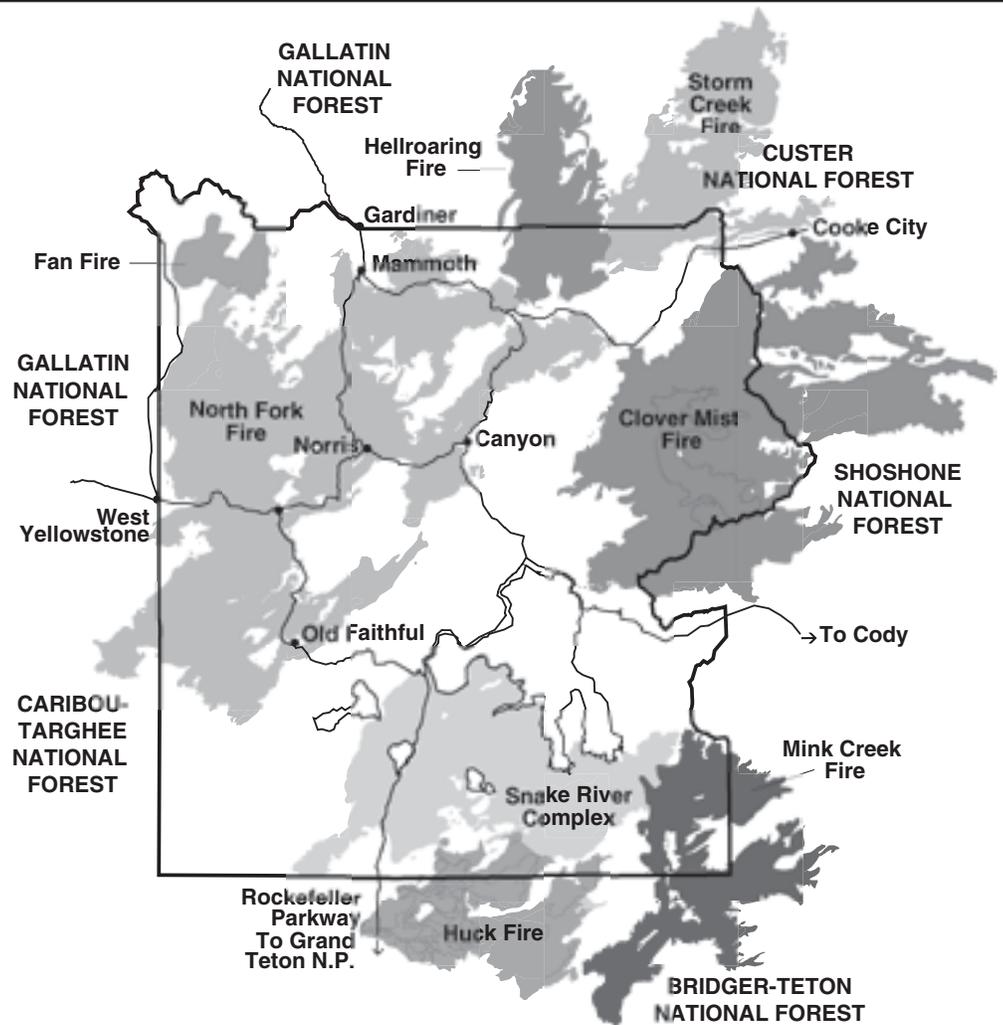
Fires are suppressed in Yellowstone if they threaten structures and communities. When a fire is being suppressed, you may see planes and helicopters and a fire camp near the road; you

may also encounter travel delays. Park visitor centers will have current information in such situations.

## The Fires of 1988

### Facts

- The summer of 1988 was the driest in the park's recorded history up until that time.
- More than 793,000 acres (36% of the park) were affected by fire.
- Fires begun outside of the park burned more than half of the total acreage.
- Humans caused 9 fires; lightning caused 42 fires.
- Approximately 300 large mammals, primarily elk, perished.
- \$120 million (1988 dollars) was spent and 25,000 people participated in this fire-fighting effort. At the time, it was among the largest in U.S. history.
- This huge effort saved human life and property, but had little impact on the fires themselves.
- Rain and snow finally stopped the advance of the fires in September.



### Aftermath

A mosaic of burns, partial burns, and unburned areas provided new habitats for plants and animals and new realms for research. Some research results are listed here.

- Fertile soils with good water-holding capacity and dense, diverse vegetation before the fire recovered quickly.
- Grasslands returned to their pre-fire appearance within a few years.
- Many of the burned forests were mature lodgepole pine; this species has recolonized most of the burned areas.
- Engelmann spruce, subalpine fir, Douglas-fir, and whitebark pine emerged within 10 years.
- Aspen reproduction increased because fire stimulated the growth of suckers from the aspen's underground root system and left behind bare mineral soil that provided good conditions for aspen seedlings.
- Some of the grasses that elk eat were more nutritious after the fires.
- Bears grazed more frequently at burned than unburned sites.
- The fires had no observable impact on the number of grizzly bears in greater Yellowstone.
- Cavity-nesting birds, such as bluebirds, had more dead trees for their nests; birds dependent on mature forests, such as boreal owls, lost habitat.
- No fire-related effects have been observed in the fish populations or the angling experience in the six rivers that have been monitored regularly since 1988.
- Vegetation growth has slowed erosion in watersheds that had erosion and mudslides after the fires, such as the Gibbon River.

### For More Information

*Yellowstone in the Afterglow: Lessons from the Fires 2000* Mary Ann Franke, Yellowstone Center for Resources

[www.nps.gov/yell](http://www.nps.gov/yell)

[www.fire.nps.gov](http://www.fire.nps.gov)

and numerous titles sold by the Yellowstone Association; [www.YellowstoneAssociation.org](http://www.YellowstoneAssociation.org)