



Wildland Fire Ecology

Resource Brief

Background Information

Fire is often thought of as a catastrophic event. In actuality, wildland fires are an essential part of the natural cycle. Many North American ecosystems evolved under the influence of fire. In fact, fire is the most prevalent type of natural disturbance in the Northern Rockies, shaping the landscape for thousands of years.

In Glacier National Park, as well as the rest of the West, lightning ignites fires in a random cyclic occurrence. Forest and grassland ecosystems are well adapted to this periodic disturbance. Fire clears out large amounts of vegetation and fuel, leaving behind burned or partially burned vegetation. On the surface, this can appear to be a loss, but it actually provides new habitat by opening up space and nutrients for new plants to grow. Fire also opens up the canopy, allowing more sunlight to reach the forest floor.

Many times, when a fire moves through an area, not all of the existing vegetation is burned. Instead a mosaic pattern of burned and unburned patches remains across the landscape. The “new” forest now holds a mixed diversity of species, some not present before the fire.

Low, moderate, and high fire severity refers to the amount of change that a particular location has sustained during a wildfire. The mixed-severity of burned and unburned forest also supports a wider variety of animal species than a homogeneous forest. Many shrubs, including huckleberry, are rejuvenated by fire, and are a food source for a variety of animals, including deer, moose, bears, and birds. Insects invade standing dead trees after a fire. Birds, such as black-backed, three-toed, and hairy woodpeckers, rely on these insects for food. Dead trees, or snags, also provide sites for denning, roosting, and nesting by various species.

Status and Trends

Human’s relationship with wildfire is a complex one. Initially, land management agencies tried to put a stop to all fires. Up until the 1960s, most managers and the public thought of fire as only a bad thing. Over the years, however, research revealed that fire is a natural process that improves habitat for many wildlife species and maintains certain forest types. In Glacier, fires burn every year. Some are less



Wildland fires are an essential part of the natural cycle, playing a major role in forest succession in the Northern Rocky Mountains.

Threats

Wildland fire plays a major role in forest succession in the Northern Rocky Mountains. The distribution of lodgepole pine, ponderosa pine, western larch, western white pine, and whitebark pine is the result of past fires. Furthermore, fire is critically important for some tree species with limited ranges. The perpetuation of whitebark pine, for example, depends on occasional disturbances. Some species are fire-dependent, meaning they need fire to complete an essential part of their life cycles. Science-based and objective-driven wildfire management can help maintain this delicate balance. As a result of climate change, temperatures in western Montana are rising and snowpack is decreasing, which means drier summers. Hotter, drier landscapes are more prone to unnaturally larger, higher-severity fires, especially where fire suppression created dangerously large fuel loads. These large fires can be too destructive to be restorative, and an ecosystem may be incapable of recovering from one.

than an acre. Others, such as the fires in 2003, have burned up to 146,000 acres.

Several different fire regimes exist in Glacier National Park. Using a variety of research methods such as examining fire-scarred trees, counting tree rings, investigating present forest structure, looking at ash layers in the soil, and carefully documenting the extent of historical burns, we know the fire return intervals for various areas of the park. Grasslands and long-needled pine forests like ponderosa pine usually burn about every 25–40 years with low-severity fires. Lodgepole pine forests, found in the North Fork area, burn in 60–80 year intervals, usually with a high severity. High-elevation mixed conifer forests may go as long as 250 years between burns.

Despite active fire suppression over the last century, much of Glacier’s ecosystem is still within natural fire regimes. Fortunately, natural fire frequencies for the majority of the forests in the park are longer than the period of total fire suppression in the park. Therefore, Glacier’s natural fire regimes are relatively intact compared to other areas throughout the West.

Management Strategy

Although many fires in Glacier are suppressed due to a variety of constraints, since 1994, the park has managed some fires for resource benefits. Fire managers set parameters within which a fire will be permitted to burn, allowing the most benefit with the least amount of risk. If fire conditions change and result in unacceptable fire

behavior that threatens park resources or the boundary, managers may elect to suppress portions of the fire.

Occasionally, for limited projects, managers can set “prescribed fires” within the park. These prescribed fires meet specific objectives, such as fuel reduction or returning fire to fire-adapted vegetation types. The goal of fires planned and ignited by fire managers is to return the natural process of fire to an ecosystem. By bringing back wildland fire to areas of the landscape where fire has been historically suppressed, managers help to improve wildlife habitat, perpetuate grassland and forest communities, and promote ecological diversity within the ecosystem.



Wildland firefighters set Big Prairie, located in the Northwest part of Glacier, on fire. Prescribed burns help perpetuate grassland and forest communities.

Resources For More Information

Glacier National Park Staff

- Dave Soleim, Glacier National Park Fire Management Officer
- Tara Carolin, Director, Crown of the Continent Research Learning Center

Documents and web sites

- Glacier Fire Management Plan
<https://www.nps.gov/glac/learn/management/loader.cfm?csModule=security/getfile&PageID=2339810>
- Forest Fire in the U.S. Rockies: A Primer – <http://www.northernrockiesfire.org>
- Glacier Fire Regime – <https://www.nps.gov/glac/learn/nature/wildlandfire>
- NPS Fire & Aviation Management RX Effects Newsletter
<http://www.nps.gov/fire/wildland-fire/what-we-do/science-ecology-and-research/rx-effects-newsletter.cfm>

The Crown of the Continent Research Learning Center

Phone: 406-888-5827; Email: melissa_sladek@nps.gov

Websites: www.nps.gov/rlc/crown, www.nps.gov/glac