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Wildland Fires: A Historical Perspective

FINDINGS

- The first wildland fire control program, established in 1885, prescribed extinguishing all fires. Since then, the policy has changed many times, such as allowing fires from lightning to burn as natural prescribed fires. The debate on whether to allow prescribed burning to lighten the fuel load or to allow mechanical thinning continues.
- Human activity is 7 times more likely to be the cause of a wildland fire than that of lightning strikes.
- As more people build homes in wildland areas, the job of the wildland firefighter becomes more complex.
- The primary classes of wildland fires are surface, crown, and ground, determined by the types of fuels involved and the intensity of a fire.

Fire is a natural environmental phenomenon and has been an integral part of our ecosystem for millennia. The population and development of North America has repeatedly brought humans into contact with fire in all manner of circumstances including wildland fires. Over the past 400 years, Americans as a society have grown to fear all forms of fire and have sought ways to suppress it as completely as possible. Wildland fires, however, pose unique challenges to the fire service and require vastly different approaches to its prevention, mitigation, and suppression. As more people choose to leave the cities and build their homes in the "wildland/ urban" interface, it is critical that these concerns are addressed.

Natural wildland fires are generally caused by lightning, which strikes the earth an average of 100 times each second or 3 billion times every year[1] and has caused some of the most notable wildland fires in the United States (e.g., Yellowstone in 1988). Other natural causes include sparks from falling rocks and volcanic activity.

Human activity, however, is the primary cause of wildland fires. Some of these fires are intentional, such as those that were used by Native Americans as signals or to drive game, those set by forestry experts, or those set by arsonists. Others, however, have been accidental, caused by carelessness or inattention by campers, hikers, or others traveling

through wildlands.[2] Figure 1 illustrates the 10-year average of fires by their cause and acreage burned.

Figure 1. 10-Year Average of Wildland Fire Causes (1988-97)[3]

	HUMAN CAUSE	LIGHTNING CAUSE
Number of Fires	102,694	13,879
Percent of Fires	88	12
Acres Burned	1,942,106	2,110,810
Percent of Acreage	48	52

The three primary classes of wildland fires are surface, crown, and ground. These classifications depend on the types of fuels involved and intensity of a fire. *Surface fires* typically burn rapidly at a low intensity and consume light fuels while presenting little danger to mature trees and root systems. *Crown fires* generally result from ground fires and occur in the upper sections of trees, which can cause embers and branches to fall and spread the fire. *Ground fires* are the most infrequent type of fire and are very intense blazes that destroy all vegetation and organic manner, leaving only bare earth.[4] These largest fires actually create their own winds and weather, increasing the flow of oxygen and "feeding" the fire.[5]

There is a dichotomy associated with wildland fires: they threaten resources we value, yet they are an essential part of most ecosystems. Several plant species even depend on it to reproduce. Some pinecones require fire to melt away a resinous coating before the seeds inside are released, while others produce seeds that lie dormant in the seedbed and germinate only after exposure to the heat from a fire.[6]

Recovery from a wildland fire begins even before the last of the flames are extinguished. After a wildland fire, essential nutrients are released back into the earth through the burning of mature plants and organic litter.[7] Additionally, wildland creatures have learned to adapt to fires. Small

animals generally hide in burrows, birds fly away, larger mammals run away, and fish are protected by the water in which they live. These animals are capable of adjusting to radical changes in their habitat, which endure until the next fire in that area.[8]

Erosion is a critical concern as heavy rains in the wake of a wildland fire can cause landslides or debris flows, and runoff can have damaging effects on water sources. In some areas, if the fire was intense enough, the soil actually becomes hydrophobic and cannot absorb water, exacerbating the situation.[9]

The first wildland fire control program was established in 1885 in the Adirondacks Reserve in New York. By the following year, a program was established in Yellowstone Park. Both were modeled on practices in use in Germany, considered the model for forest

management, which were to extinguish all fires regardless of severity. In 1910, these policies were reexamined after catastrophic blazes burned 5 million acres and killed 79 firefighters. As a result, the U.S. Forest Service (USFS) “declared war” on forest fires and launched an aggressive campaign of fire prevention and control.

In 1926, after questions arose regarding the merits of light burning, the USFS adopted a policy that would allow areas of 10 acres or less to burn, but required the suppression of all fires over 10 acres. The Tillamook burn in 1933 destroyed 3 million acres of virgin timberland in the Northwest. In its wake, the USFS reverted to an even more stringent “no burn” policy and mandated that all fires were to be extinguished during the first duty shift after its discovery or by 10 a.m. the following day. This policy remained in effect and was reexamined in 1971 when the USFS changed its policies to allow some lightning fires to burn as natural prescribed fires.

In 1978, the USFS again revised the policy, this time excluding the 10 a.m. objective. The emphasis was shifted to managing fire suppression costs so that they are consistent with land and resource management strategies. By 1988, changes in policy by the USFS and National Park Service allowed many natural fires to burn on federal wildland.[10]

Despite policy and myriad suppression efforts, wildland fire has been a continued problem in America's forests. Figure 2 illustrates some historically significant wildland fires.

Figure 2. Selected Historically Significant Wildland Fires[11]

DATE	NAME	LOCATION	ACRES	SIGNIFICANCE
Oct 1871	Peshtigo	Wisconsin/Michigan	3,780,000	1,500 fatalities in Wisconsin
Sep 1894	Hinckley	Minnesota	Undetermined	418 lives lost
Sep 1894	Wisconsin	Wisconsin	Several million	Undetermined; some lives lost
Aug 1910	Great Idaho	Idaho/Montana	3,000,000	85 fatalities
1949	Mann Gulch	Montana	4,339	13 smokejumpers killed
Sep 1970	Laguna	California	175,425	382 structures destroyed
1987	Siege of '87	California	640,000	Valuable timber lost on the Klamath and Stanislaus National Forests
1988	Yellowstone	Montana/Idaho	1,585,000	Large acreage
Oct 1991	Oakland Hills	California	1,500	25 lives lost and 2,900 structures destroyed
Jul 1994	South Canyon	Colorado	1,856	14 firefighter fatalities
1998	Volusia Complex	Florida	111,130	Thousands of people evacuated from several counties
1998	Flagler/St. John	Florida	94,656	Forced the evacuation of thousands of residents
May 2000	Cerro Grande	New Mexico	47,650	Originally a prescribed fire; 235 structures destroyed; damaged Los Alamos National Laboratory

Today, fire suppression agencies throughout the country are increasingly challenged by wildland fires that affect structures located in areas that are essentially wildland. The question of what to do with the urban/wildland interface has become one of the most controversial in the fire service. Some have argued that it is not appropriate for publicly funded fire suppression personnel to be dedicated to protecting homes built in this dangerous area when they can be better utilized elsewhere. Others, however, claim that one has the right to build home anywhere he or she wants, in spite of the possible ramifications of such an action. Another controversy is over how to thin the forests and lighten their fuel load. Some argue the emphasis should be on prescribed burning while others are proponents of mechanical thinning (cutting trees strategically).

Given the political, ecological, and economic implications of any decision affecting residents and homes in the interface, these debates are likely to continue for years to come.

NOTES:

1. Ainsworth, Jack and Doss, Troy Alan, *Natural History of Fire and Flood Cycless*, University of California, Santa Barbara, 1955.
2. "History of Fire," National Park Service, www.nps.gov/pub_aff/issues/fire.html.
3. Based on data from the National Interagency Fire Center.
4. Ainsworth, Jack, loc. cit.
5. *This Thing Called Fire*, National Interagency Fire Center.
6. Ainsworth, Jack, loc. cit.
7. Idem.
8. "History of Fire," loc. cit.
9. *T*After the Fires: Let the Healing Begin, National Interagency Fire Center.
10. The last three paragraphs were adapted from *Wildland Fire Management: Federal Policies and Their Implications for Local Fire Departments*, U.S. Fire Administration, 1990.
11. National Interagency Fire Center.

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