

# A Synopsis of Large or Disastrous Wildland Fires<sup>1</sup>

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**Abstract:** Wildland fires have occurred for centuries in North America and other selected countries and can be segregated into three periods: prehistoric (presuppression) fires, suppression period fires, and fire management period fires. Prehistoric fires varied in size and damage but were probably viewed fatalistically. Suppression period fires were based on policy that excluded fire from many ecosystems where it played an important role; the view of fire as an undesirable wildland disturbance was fostered during this period. Recognition of fire's roles led to a managed use of fire; however, large and disastrous fires still occur because of large fuel accumulations during the fire suppression period.

Fires burning in vegetation have been termed "forest" fires, or, more recently, "wildland" fires. If these fires also involve structures, they have been termed "urban," "interface," or "intermix;" i.e., "urban/wildland" fires. Although these types of fires are not new, in the past 30 years we have begun to consider these fires as a separate and very important group of fires—fires that require a great deal of energy to suppress, and from which property and human lives have been lost.

Despite these disastrous fires, we must consider that in natural systems fire is generally neither good nor bad; it just occurs. We might consider that the extinction of a species caused by fire would be a bad or disastrous event. However, is it a disastrous event or merely part of the natural progression of systems? The decision to term an event "good," "bad," or "disastrous" means that human values have been attached to it.

Our concepts of wildfires as bad or disastrous probably result from both our association with the loss of structures to fire, and the Northern European education of the leaders of the conservation movement in North America. Our association with urban fires was always that of loss of values and life. When the conservation movement began in North America in the late 1800's, fire was considered the number-one enemy, and more than 90 percent of the early forestry practices in the early 1900's excluded fire from wildland systems. This approach completely ignored the role of fire in these systems and the use of fire by Native Americans to manipulate their environment.

This paper summarizes the history of large and disastrous fires, in the United States and other nations—from the prehistoric fire regimes, to the suppression period (1910-1960) to the fire management period (1960 to the present).

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## Prehistoric Period

Fires were started primarily by humans and lightning in the prehistoric period, although other sources such as volcanism were temporally and spatially important. Friction, sparks, or refraction were also possible as fire sources. The first fires probably began shortly after plants first produced terrestrial biomass, or when aquatic biomass dried and was susceptible to burning. Ignitions by humans or our predecessors are relatively recent in geologic time, and especially recent in locations such as North America.

Ignitions caused by our early predecessors would normally result in a fire regime modified to a shorter period between, and reduce the variability of, a fire season and its severity, as the fires set for any given purpose would better accomplish this if set for a predetermined prescription. When fires were ignited by non-human sources, the conditions for spread could have varied widely.

For California, it has been estimated that prehistoric fires covered an average of 5.5 to more than 13 percent of the State every year (Martin and Sapsis 1992). Fires also have covered substantial areas of other parts of North America, Australia, and Africa ignited by both lightning and humans.

## Settlement Fires

Fires during the settlement period were the largest and often involved the largest loss of lives of any recorded fires (*table 1*). During this period attitudes about wildland fires were complacent or even fatalistic. Logging created large areas of undecayed slash, and fires were started indiscreetly to burn slash or make land attractive to homesteading. Without any means to control fires, settlers were at the mercy of the weather once fires began to spread.

## Suppression Period Fires

The disastrous fires of the late 1800's and early 1900's led to the feeling of a need to control the fires. Thus, when the 1910 fires of northern Idaho, western Montana, and eastern Washington occurred, a skeleton force of firefighters attempted to control them. Tools and equipment were simple, and knowledge of fire behavior primitive. Nevertheless, this was the beginning of the fire suppression period that lasted about 50 years (*table 2*).

Along with the suppression effort was a strong fire prevention effort. Fire was labeled as evil, and the campaign against fire often took on the aspects of a religious crusade. Although some spoke in favor of a moderate policy, and even the use of fire as a tool in wildland management, they were

**Table 1—Major-settlement period fires, before 1910.**

| Fire Name         | Location                                                      | Date | Size and Losses <sup>1</sup>                  | Comments <sup>2</sup>                  |
|-------------------|---------------------------------------------------------------|------|-----------------------------------------------|----------------------------------------|
| Miramichi         | Maine                                                         | 1825 | 1.2 MM Ha; Lives                              | Many fires, undetermined drought; wind |
| Black Thursday    | Victoria, Australia                                           | 1851 | 10 killed                                     |                                        |
| Peshtigo/Michigan | northeast Wisconsin<br>Upper Michigan                         | 1871 | 1.6 MM Ha;<br>1,200 to 1,500 killed           | Many fires, drought, wind              |
| Michigan          | primarily northeast<br>("thumb") area of<br>southern Michigan | 1881 | 400 M Ha; 169 killed                          | Many fires, drought, hot               |
| Hinckley          | Minnesota                                                     | 1894 | 418 killed                                    | Many fires, drought, hot               |
| Far West          | Yacoult, Washington                                           | 1902 | >500 M Ha; 38 killed<br>low relative humidity | Dry summer; hot, windy,                |
| Adirondack        | New York                                                      | 1903 | 258 M Ha; none killed                         | Dry winter, strong winds               |

<sup>1</sup>M = 1,000; MM = 1,000,000<sup>2</sup> Haines and others (1986) present evidence that many of these fires occurred without drought or severe weather preceding the fire, based on historical weather records. (Brown and Davis 1973, Forest Fire: Control and Use; Australia, C. Trevitt and P. Cheney 1973).**Table 2—Suppression-period fires, 1910 to 1960.**

| Fire Name                              | Location                                                  | Date | Size and Losses <sup>1</sup>                            | Comments <sup>2</sup>              |
|----------------------------------------|-----------------------------------------------------------|------|---------------------------------------------------------|------------------------------------|
| Great Idaho                            | northern Idaho,<br>western Montana,<br>eastern Washington | 1910 | 1.2 MM Ha; 85 killed                                    | Hot, dry, windy; spring and summer |
| Cloquet                                | Minnesota                                                 | 1918 | 551 killed                                              | Hot, dry, windy                    |
| Victoria                               | Australia                                                 | 1919 | 3 killed                                                | Fires burned for 6 weeks.          |
| Berkeley                               | Berkeley, California                                      | 1923 | 584 structures destroyed                                | East winds                         |
| New South Wales<br>and Victoria        | Australia                                                 | 1926 | 31 killed, 2,000 homeless                               |                                    |
| Mill Valley                            | N. California                                             | 1929 | 117 homes lost                                          |                                    |
| Tillamook                              | Oregon                                                    | 1933 | 126 M Ha                                                | Dry, hot summer, east winds        |
| New South Wales<br>and Victoria        | Australia                                                 | 1939 | 1.37 MM Ha, 71 killed,<br>over 1,000 homes<br>destroyed |                                    |
| Marshfield                             | Massachusetts                                             | 1941 | 450 homes lost                                          |                                    |
| Southern California<br>(series)        | southern California                                       | 1943 | 200 homes lost                                          |                                    |
| Maine Forest Fire<br>Disaster (series) | Maine                                                     | 1947 | 1200 homes; 16 lives lost                               |                                    |
| New South Wales                        | Australia                                                 | 1951 | 3.5 MM Ha; 6 killed                                     |                                    |
| Manchuria                              | China                                                     | 1956 | 400 M Ha                                                |                                    |

<sup>1</sup>M = 1,000; MM = 1,000,000<sup>2</sup>Sources: Brown and Davis 1973; Trevitt and Cheney 1973.

overruled by those in favor of fire exclusion (Pyne 1984). Although scientific evidence supported the use of fire, the political accidents of gaining control in Washington, DC, led to a policy of fire exclusion.

## Urban Interface and Fire Management Period

During the urban interface and fire management period, wildland fires began to involve structures again, and the idea

of fire management began to evolve. Wildland fires had not been involved with structure losses in the United States since the 1923 Berkeley fire. Suddenly, because of the Harlow and Bel Air Fires of 1961, wildland fire threats to urban areas were again a reality. Although many in the fire service and those in the academic community such as Harold Biswell recognized the potential threat of wildland fires to urban areas, many years passed before a broader awareness of the problem evolved.

**Table 3—Fires of the urban interface and fire management period, 1961 to the present.<sup>1</sup>**

| Fire Name                 | Location                     | Date | Size and Losses <sup>2</sup>                            |
|---------------------------|------------------------------|------|---------------------------------------------------------|
| Harlow                    | central California           | 1961 | 106 homes; 2 lives lost                                 |
| Bel Air                   | southern California          | 1961 | 505 homes lost                                          |
| Dwellingup                | western Australia            | 1961 | 146M Ha; 140 bldgs lost                                 |
| New Jersey Fires (series) | New Jersey                   | 1963 | 458 homes; 7 lives lost                                 |
| Staten Island             | New York                     | 1963 | 100 homes lost                                          |
| Parana                    | Brazil                       | 1963 | 2 MM Ha; 5000 homes; 110 lives lost                     |
| Hanley, Nuns Canyon Fires | northern California          | 1964 | 295 homes lost                                          |
| Coyote                    | southern California          | 1964 | 106 homes lost; 2 lives lost                            |
| Tasmania                  | Australia                    | 1967 | 263 M Ha; 1246 buildings; 62 lives lost                 |
| Wright, Los Angeles       | southern California          | 1970 | 103 homes lost                                          |
| Laguna, San Diego         | southern California          | 1970 | 382 homes; 5 lives lost                                 |
| Sycamore, Santa Barbara   | southern California          | 1977 | 234 homes lost                                          |
| Kanan, Los Angeles        | southern California          | 1978 | 224 homes; 1 life lost                                  |
| Panorama, San Bernardino  | southern California          | 1980 | 325 homes; 4 lives lost                                 |
| Ash Wednesday Fires       | Victoria and South Australia | 1983 | 392M Ha; 2545 bldgs; 75 lives lost                      |
| Black Dragon              | northern China               | 1988 | >2 MM Ha                                                |
| 49er                      | northern California          | 1988 | 148 homes lost                                          |
| Paint, Santa Barbara      | southern California          | 1990 | 479 homes; 1 life lost                                  |
| Tunnel, Oakland/Berkeley  | northern California          | 1991 | 2103 structures, (2475 living units); 25(26) lives lost |
| Fountain, Redding         | northern California          | 1992 | 450 homes lost                                          |
| Altadena, Los Angeles     | southern California          | 1993 | 118 homes lost                                          |
| Laguna, Orange County     | southern California          | 1993 | 366 homes lost                                          |
| Malibu, Los Angeles       | southern California          | 1993 | 350 homes; 3 lives lost                                 |
| New South Wales           | Australia                    | 1994 | 1.2 MM Ha; 185 homes plus other bldgs; 3 lives lost     |

<sup>1</sup>Sources: California, Reports of the California Department of Forestry and Fire Protection; Australian, P.Cheney, and C.Trevitt ; Brazil, R.Soares. United States fires from Brown and Davis, 1973, Forest Fire: Control and Use; Australia, C. Trevitt and P. Cheney. Eleven Fires from United States are from Brown and Davis, 1973, Forest Fire: Control and Use; Australian, C. Trevitt and P. Cheney; California, Reports of the California Department of Forestry and Fire Protection.

<sup>2</sup> M = 1,000; MM = 1,000,000

Although the list of fires for this period (*table 3*) is not complete, it illustrates that large and disastrous wildland or urban/wildland fires have not diminished; if anything, they have continued to increase in frequency. Numbers of structures lost has increased. In California, as many as 3,500 homes were lost to urban/wildland fires in the 7 decades from 1920 to 1989. In the early 1990's, about 4,200 homes were lost. Although the numbers of human lives lost to wildland fires has decreased since the settlement period, during the last 70 years, loss of life continues because of wildland fires.

## Summary

Fire has been part of many terrestrial vegetation communities, and the use of fire as a powerful tool by many native peoples around the world was an important factor in their survival or extinction. Fire was foreign to the land management philosophy during expansion of the conservation movement. This fact, in addition to the large fires that had occurred, led to a policy of fire suppression and exclusion.

Large wildland fires usually are described as “disastrous” when large losses of human life or property occur, as with the “disastrous” 1988 Yellowstone fires. Yet in terms of effects on natural systems, the fires were not disastrous.

Losses of homes or structures increased during the fire management period. This is probably because of more people living near vegetation without the advantage of livestock or other means to manage fuels near structures. The fire

management period itself, which advocates fuels management, is not responsible for the increase in acreage and homes lost. Rather, it is the long-term fuel accumulation from the suppression period that has contributed to the fire problem. Today, even with the recognition of the need for fuels management in both vegetation and structures, the most ecologically sound tool for managing fuels—prescribed burning—is severely underused because of human inertia and air quality constraints. Some local programs are vigorously attacking vegetation and fuels management, but we can continue to expect large fires and large losses of structures because of the immensity of the urban/wildland fire problem.

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