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CAT TOPICS — WILDFIRE

"It was an unusually hot period, we had not seen rain in nearly two months, and vegetation and grass was dry as tinder."

This could be the beginning of a novel, but is instead a common description of the conditions prior to many of the largest and costliest fires in recorded history. Wildfires or wild land fires are a natural hazard that poses a threat to both lives and property, can be difficult to control, and can cause wide-ranging destruction.

The following is a brief synopsis of historical wildfire events, a high-level view of wildfire science, and a discussion of the tools available to mitigate this threat.

HISTORY

Wildfire is not a hazard or phenomena unique to North America, though each year there are numerous reports about such events in states like California. Major wildfires have occurred throughout the world in Australia, France, Germany, Greece, Indonesia, Italy, Poland, and Russia. The consequences are typically measured in terms of hundreds or thousands of buildings destroyed, number of lives lost, and millions of dollars in property damage and resources spent fighting the wildfire.

Notable global wildfire incidents include:

- **October 1871: Peshtigo, Wisconsin, US** — Wildfire destroyed approximately 3.8 million acres and some 1,500 people were killed in one of the worst forest fires in US history.
- **October 1991: Oakland County, California, US** — Oakland Hills Fire was believed to have been caused by a grass fire that destroyed 1,520 acres and nearly 3,800 residential structures, and killed 25 persons. The estimated cost was nearly US$1.5 billion.
- **October 2003: San Diego and San Bernardino Counties, California, US** — The Cedar Fire (San Diego County) was human caused, destroying over 2,200 homes and killing 15 people. It was the largest recorded fire in California history. The Old Fire (San Bernardino County), along with 15 other fires in the area, was larger prior to the Cedar Fire.
- **February 2009: Victoria, Australia** — An estimated 400 individual brush fires destroyed 3,500 structures and killed 173 persons. It was the highest loss of life from brush fire in Australian history.
- **March 2010: Western Russia** — Several hundred individual wildfires caused an estimated US$15 billion in damage.
- **May 2016: Alberta, Canada** — The Fort McMurray Wildfire destroyed at least 2,400 homes and buildings, though fire suppression efforts spared 25,000 homes, the local hospital, and schools. The fire, mass evacuation, and supply disruption forced up to a third of Canadian oil output offline. With estimated losses of around CDN$4 billion, it is the costliest disaster in Canadian history.

THE SCIENCE OF WILDFIRE

Devastating wildfires have common characteristics. They can occur whenever there has been unusually warm or hot temperature for an extended period of time combined with low humidity and lack of rain. This combination of weather conditions leads to dry brush, trees, and grass, making the area more susceptible to fire from natural or human-initiated causes.

Wildfires are usually driven by strong surface winds. Adding to the phenomena, a wildfire also creates its own weather atmosphere as it burns. The hot flames and gases rise rapidly from the fire and displace the relatively cooler surrounding air. This displacement leads to surface wind patterns that can blow at speeds of 70 miles per hour — near-hurricane force. This creates a fast moving fire front that consumes the dry brush and any other combustible material, including structures.

Little is left of this home near San Bernardino, CA following wildland fire in October 2003. (FEMA photo/Kevin Galvin)

Fire approaches a gift shop in Yellowstone National Park September 7, 1988. (National Park Service photo)

WILDFIRE ASSESSMENT AND MITIGATION STRATEGIES

As population centers expand and more people build homes at the edge of forest or wild land areas, there are more people and structures at risk. Some estimates show the number of persons exposed to brush fire doubled from 1970 to 2000.

The Insurance Services Office (ISO) has created a model for assessing the wildfire risk to an area. The model for the United States combines satellite images and information regarding soil conditions, land slope, vegetation, and access roads. This model, according to ISO reports, classified 97.5% of the area burned in the 2003 San Bernardino fire as having fuels (e.g., tall grass, trees, dense brush, and forest) conducive to and favorable for wildfire conditions.

MODELING WILDFIRE

Leading natural hazard catastrophe modeling organizations offer software-based analysis of portfolio locations to determine probabilistic risk of wildfire loss. The current models are developed for California locations and include:

- USGS data for fuels.
- Historical event and ignition locations.
- Estimated wind speeds and direction.
- Human fire fighting intervention (fire breaks).
- Structure vulnerability and construction.

Many major US municipalities offer wildfire risk maps that identify areas at risk to wildfire. These include the Association of Bay Area Governments (ABAG) in California, as well as local and state agencies in Colorado, Oregon, and Florida, among others. Various international agencies also promulgate wildfire risk maps and mitigation guidelines. Among these are the European Forest Fire Information System (EFFIS), Fire Protection Association of Australia, Russian Federal Forestry Agency (FFA), and Italy's Central Functional Centre.

Wildfire mitigation strategies focus on creating awareness of wildfire conditions and prevention of dry vegetation and fuels in close proximity to inhabitable structures, especially when such conditions persist.

Awareness efforts focus on alerting persons to the need for extreme caution with cigarettes, campfires, trash burning, and any other flame or fire use during periods when the wildfire danger is extremely high. Bans are typically issued for open flames when the potential conditions exist.

Prevention, aside from controlling open flames, focuses on removing the fuel near structures. Creating a defensible space, as it is called, helps reduce possible fire travel from burning brush to the structure and allows fire fighting personnel to make a defensive stand to protect the structure. Many organizations in wildfire-prone areas maintain such a space regularly as best practice.

Best practice defensible space creation activities typically include:

- Using fire-resistant roofing material.
- Clearing dead leaves and twigs from roof and gutters.
- Keeping wood piles and LPG tanks at least 30 feet from the structure.
- Removing large bushes within 5 feet of the structure.
- Removing tree limbs within 15 feet of the ground and structure.
- Removing tall grass within 30 feet of the structure.

Organizations located in an area susceptible to wildfire should have an emergency evacuation plan along with a business contingency plan. Many times there is only a few hours advance notice of evacuation during a wildfire event. It may also be several days before authorities allow access to a fire zone following evacuation. In the event of building damage, the resumption of operations may be delayed.

The National Fire Protection Association (NFPA) addresses wildfire danger and prevention with Standard 1144, "Standard for Reducing Structure Ignition Hazards from Wildland Fire," which organizations in wildfire-prone areas should review and seek to implement well in advance of a wildfire event.

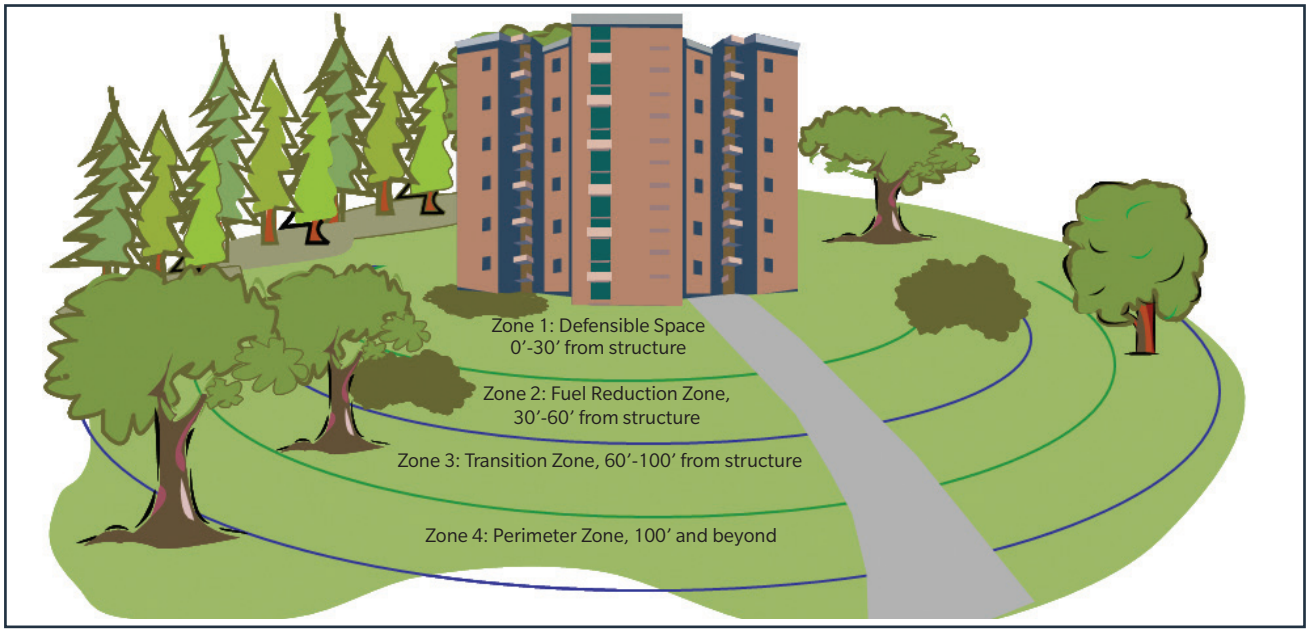

Illustration of Defensible Space (from Wildfire Risk Reduction in Florida, Florida Department of Agriculture and Consumer Services)

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For additional information about wildfire exposures and the best practice mitigation solutions that Marsh Risk Consulting can provide, please contact your local Marsh representative or:

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You can find further insight on wildfire exposures and related solutions on: www.marsh.com or www.marshriskconsulting.com.