



UNDERSTANDING THE HAZARD

Wildland Fire Exposure

NATURAL HAZARDS

When companies build facilities in or near undeveloped areas, such as forest and grassland, they are exposed to potential wildland fires. FM Global can help you evaluate the risk this hazard presents to your facility and recommend steps you can take to protect your business.

UTH TOPIC CATEGORIES:

CONSTRUCTION

EQUIPMENT

FIRE PROTECTION

HUMAN ELEMENT

NATURAL HAZARDS

PROCESS HAZARDS

This series of publications is designed to help you understand the everyday hazards present at your company's facilities. For more information on how you can better understand the risks your business and operations face every day, contact FM Global.



The Hazard

Wildland fires can occur when prolonged dry weather causes the moisture levels of grass, brush and trees to become low. Called "bushfires" in Australia, other terms such as "forest fire," "grass fire," and "brushfire" also refer to this phenomenon. When strong winds (such as those in California, USA, called "Santa Ana winds") are present, they increase the intensity of the fire and quickly spread it over a wide area, exposing all buildings and equipment in the vicinity.

With ongoing climate change and more development at the wildland/urban interface, wildland fires have become more frequent and more destructive. Although residential homes continue to be most at risk, wildland fires are becoming a serious threat to many industrial and commercial enterprises as well.

Science of the Hazard

The wildland fire hazard exists throughout the world wherever there is a large amount of vegetation together with weather patterns that include periods of low rainfall. Climates with cool, wet winters and hot, dry summers (with little or no rain for two to three months) are at most risk. Global climate changes in recent years seem to be increasing the frequency and severity of these fires. Some parts of the world are already well known for wildland fires, including southern Australia, the western United States, Canada, and parts of Europe.

Wildland fires are a particular hazard in the "wildland-urban interface." A wildland-urban interface is an area in which human-made structures intermingle with undeveloped terrain, such as forest and grassland. The vegetation in these areas is a huge potential fuel source that, when allowed to grow too near a building, can expose a facility to a wildland fire.

Fuel (vegetation), weather and topography work together to determine how fast a wildland fire will travel and at what intensity. A "surface" forest fire, which primarily burns undergrowth and leaf litter, burns faster than a "ground" forest fire, which burns below vegetation, shielded from air currents. Grass fires will burn faster than surface forest fires because they are exposed to the full force of the wind. "Crown" fires occur in the tops of trees and, under extremely windy conditions, have been known to jump rivers and even lakes.

Wind speed and direction have a huge impact on the path a wildland fire ultimately will take. It is not unusual for one structure to be completely destroyed by fire, while the building next door to it remains unaffected.

What you can do at your facility

NOW:

- Remove combustible vegetation within 5 ft. (1.5 m) of buildings and equipment.
- Keep gutters free of debris.
- Cover vents with wire mesh to keep burning embers out.
- Remove all combustible yard storage.
- Develop a written pre-incident plan with the fire service.

SOON:

- Replace wood roof shingles with tiles or slate materials.
- Remove exposed vegetation to create a reduced-fuel zone as outlined in FM Global Property Loss Prevention Data Sheet 9-19, *Wildland Fire*.
- Change exposed walls and windows to classify as noncombustible or 1-hour fire-rated exposed construction.
- Provide an adequate and reliable water supply to meet automatic sprinkler and hose stream demands.

The slope of land around a structure also will affect how fast the wildland fire may reach it. For example, a grass fire can climb a hillside with a 30° slope four times faster – and with flames twice as high – as a fire on level ground.

The best way to mitigate the hazard of a wildland fire is to create a reduced-fuel zone around buildings and structures. Refer to FM Global Property Loss Prevention Data Sheet 9-19, *Wildland Fire*, for additional guidance.

Often, wildland fires are set by people, either intentionally or accidentally. However, they can also be the result of lightning or burning debris. The fire service works to reduce the wildland fire threat by conducting “prescribed” burning that thins out the forest and removes dead trees, limiting potential fire spread.

The possible consequences of wildland fire also include mudslides and falling rocks. These occur when fire burns away trees and bushes that keep soil on hillsides in place. When rainfall eventually saturates the soil, rapid erosion and slope failure can result.

Loss Experience

Over a recent 10-year period, FM Global clients reported a total of 298 wildland fire-related losses. The gross cost of these losses totaled US\$447 million, for an average loss of approximately US\$1.5 million.

Wildland fires pose a serious exposure to facilities and commercial properties located in areas where there is a large amount of vegetation along with weather patterns that include periods of low rainfall. Two FM Global client locations recently experienced wildland fire exposures under similar circumstances, but the outcomes varied greatly based on actions taken (or not taken) to prepare for such an event.

In a small town in California, flames from a vegetation fire moved quickly, driven by winds reported at 55 mph. An assisted-living facility with minimal woodland clearance around the property suffered over US\$30 million of property damage and took a year to rebuild.

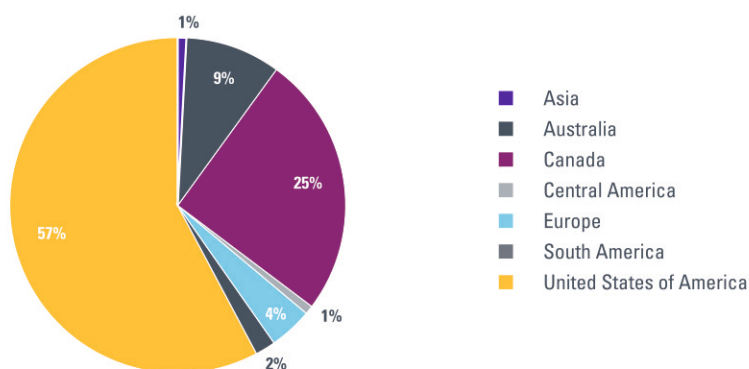
At a different location in California, a wildland fire surrounded a university campus, allowing smoke and soot to enter student apartment buildings, classrooms, and other areas. One sprinkler extinguished a small fire caused by hot embers in the attic of a student residence hall. Fortunately, because of the university's loss prevention efforts, there was minimal thermal damage to the structures. The wildland fire exposure at this site was mitigated by a reduced-fuel zone created around all buildings as part of the university's brush-clearing maintenance program. During the fire, the emergency response team and the fire service monitored the progress of the fire and worked to extinguish hot spots as they developed. The property damage at the university was under US\$3 million.

The difference in the outcomes of these two wildland fire exposure events reinforces the importance of establishing a reduced fuel zone around your facility and maintaining a well-prepared and trained emergency response team.

How Wildland Fire Spreads

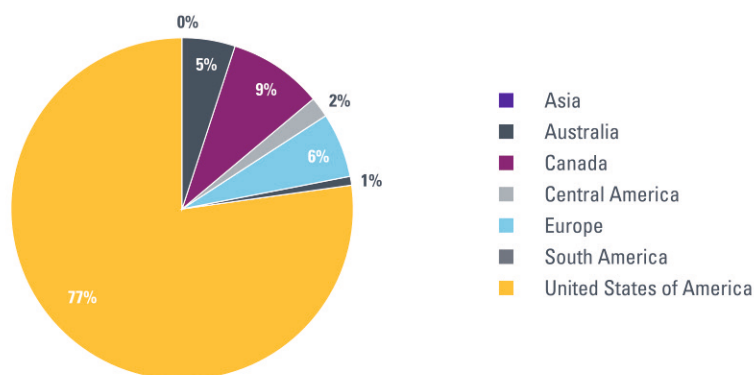
- Flying embers blown by wind can land on and ignite combustible external elements of the building construction, yard storage, vegetation, or debris. Embers can also enter a building through openings in the building envelope and are the most common wildland fire ignition source.
- Heat radiating from flames near the building can raise the temperature of the exposed building components, causing them to reach their autoignition point.
- Fire can spread to the walls of the building so there is direct flame impingement.

LOCATION OF WILDLAND FIRES BY NUMBER OF LOSSES



Source: FM Global clients

LOCATION OF WILDLAND FIRES BY LOSS COST



Source: FM Global clients

But What About...

...MANAGING THE VEGETATION AROUND MY BUILDING PERIMETER? CAN I CONDUCT PRESCRIBED BURNING ON MY OWN?

Prescribed, low-intensity burning to remove vegetation should only be conducted under certain weather conditions. Plan and coordinate this activity with the fire service. Also, you may need to obtain a permit before conducting any burning.

...THE VEGETATION AROUND MY FACILITY? DO I NEED TO REMOVE IT ALL TO CREATE A REDUCED-FUEL ZONE?

No, it is not necessary to remove all vegetation within the reduced-fuel zone; however, remove trees and shrubs so there is no continuous canopy or line of vegetation from wildland/bushland to the buildings. Vegetative debris, including dead leaves, bark, pine needles, and twigs should be removed. Retain the moisture content of foliage by regular watering during the summer.

Need more information?

Ask your FM Global engineer or client service team about the following:

- FM Global Property Loss Prevention Data Sheet 9-19, *Wildland Fire*
- FM Global Wildland Fire Emergency Response Plan Template (F7646)
- FM Global Emergency Checklist – Wildland Fire (W329000)

Don't Let This Happen to You



Increasingly, companies are building their facilities in remote areas, creating a wildland-urban interface. Failure to properly maintain vegetation surrounding these structures can result in a catastrophic loss if a wildland fire occurs.

Ordering Information

For additional copies of *Understanding the Hazard* publications, contact your FM Global engineer or client service team.

Additional FM Global brochures and educational material can be found in the FM Global Resource Catalog and ordered or downloaded online at fmglobalcatalog.com. Or, for personal assistance worldwide, contact our U.S.-based customer services team, Monday – Friday, 8 a.m. – 5 p.m. ET :
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