



Business Resilience for Wildfire Events



Wildfires are a growing threat to people and property in the U.S. due to persistent drought, warmer temperatures, periodic high winds, and excessive dried vegetation in forests and grasslands. Additionally, more key infrastructure – power plants, airports and even industrial sites – is being placed in close proximity to wildland areas, increasing the risk for property damage and loss of life



In the early 20th century, forest management policies actively sought to suppress all wildfires to preserve timber and real estate. These policies had unintended consequences, as they also interrupted the natural process for controlling fuel loads within these wildland areas.

While forestry and firefighting practices have evolved since then, pests like the bark beetle and invasive plant species continue to increase the amount of highly combustible fuels within wildland areas. More recently, the impact of climatological changes on seasonal temperatures and droughts has further increased the risk and extended the season of fire weather conditions, when high winds and low humidity create ideal conditions for ignition. This problem is compounded by the fact that over the last 40 years, particularly in places like California, residential and commercial developments have continued to expand into high-risk areas known as the wildland-urban interface or intermix; areas where forest land adjoins human development or human development is within forested areas, bringing with it human fuel loading and ignition sources as well.

This mix of climate, natural and socioeconomic changes has led to a dramatic increase in the need for active firefighting operations, as fires grow larger and move more quickly through wildland areas. The consequence has been fewer resources for proactive forestry management practices such as prescriptive burning and mechanical clearing that can, to some extent, help

manage the severity of wildland fire in high risk areas. Most importantly, all of these factors are dramatically increasing the risk of property damage and loss of life when wildfires occur.

Over the past decade in the U.S., an average of 6.8 million acres were consumed by wildfire. In 2020, 10.1 million acres burned, the third time in five years that at least 10 million acres were consumed. While wildfire risk exists throughout most of North America, the impact is most significant in western U.S. states, particularly California. The August Complex Fire, ignited by lightning in late summer 2020, burned 1.03 million acres through seven counties and was the largest fire in California history. In fact, six of the 20 largest California wildfires of all time (by acres consumed) occurred in 2020, highlighting the severity of the current risk. Wildfire is not just a threat in the U.S., of course – in Canada, an average of 2.5 million hectares (6,177,635 acres) of wildland areas are consumed each year.

There is great concern about the potential for severe wildfires in the future due to persistent drought in the western United States. According to the Insurance Information Institute and the U.S. Drought Monitor, 95% of land in western U.S. states is experiencing moderate to severe drought. The early season Bootleg Fire in Oregon and Dixie Fire in California in 2021 consumed nearly 1,000,000 acres, driven by high winds and extremely dry fuels as a result of the drought conditions. The southern portions of Alberta, Saskatchewan, Manitoba and British

Columbia are also experiencing similar drought conditions. In British Columbia, a provincial state of emergency was declared in late July 2021 due to extensive wildfire activity.

These statistics make one thing clear: It has never been more important for businesses to review their exposure to wildfire and implement strategies to increase the resilience of their buildings and operations.

Protecting Property from Wildfire

The two main aspects of a building's ability to resist wildfire damage are the details of the construction and the characteristics of the defensible space, a cleared area surrounding the building. Wildfires can find any weak links in the defensive measures you take to protect your property, but small steps can improve a structure's ability to withstand wildfires.

Defensible Space

A cost-effective way to reduce the risk of a wildfire impacting a location is by creating what's known as a defensible space. This is an area around the structure where vegetation, debris and other combustible fuels are treated, cleared or reduced to slow the spread of wildfire towards the structure. A defensible space can protect a building from wildland fire, slow the spread of wildfire and provide clear space for firefighters to do their job effectively.

Area Closest to the Structure

For the area up to 30 feet around the primary structure, all combustibles and flammables that can potentially support a wildfire should be removed, such as vegetation, debris and miscellaneous combustibles. This clear space is measured from the outside edge of building eaves and attached structures. The area within five feet of the structure, sometimes referred to as the ember-resistant zone, is particularly important with resisting ignition from windblown embers (see the Wildfire-Resistant Construction section below).

Take the following steps in this zone:

- Remove all materials that can burn, including trees, shrubs and combustible mulch.
- Remove branches overhanging the roof, chimney or other exterior projections.
- Keep grass mowed to a low height (3-4 inches), and remove weeds often.
- Do not store or stack combustible materials against buildings.
- Make sure chimneys, attic, roof, eaves and foundation vents are kept in good condition and screened (see the Wildfire-Resistant Construction section below).
- Locate liquid propane and other fuel tanks at least 30 feet away from any building, at the same elevation as the building. Never locate the tank below a building since fires tend to burn uphill. If the tank is located above the building and begins to leak, liquid propane gas could flow downhill into the building. Maintain 10 feet of vegetation-free space around tanks.

Middle Area

The size of this area depends on the slope of the ground where the structure is built. Usually, this space should extend at least 30-100 feet from the structure. Take the following steps in this area:

- Thin out and prune trees and large shrubs with at least 10 feet between crowns.
- Dispose of dead vegetation and brush (slash) from the thinning.
- Remove dead stems from trees and shrubs annually.
- Maintain the canopy of all trees at least six feet above the ground
- Limit the number of dead trees within this area by removing them whenever possible.

Outer Area

This area of traditional forest management extends from the edge of the middle area all the way to your property boundary lines. In these areas, forestry management including removal of ground fuels, thinning of trees and branches, and similar techniques used in the middle zones can reduce fuel loading on your property.

Wildfire-Resistant Construction

In order to understand how a structure can be made wildfire-resistant, it is important to first understand the three ways wildfire can threaten a structure or building: wind-blown embers, direct contact by flames and radiant heat.

- The leading cause of structure loss during a wildfire, embers are burning pieces of vegetation or construction materials that can be lofted high into the air, carried by wind far away from the actual fire, igniting fuels and structures as far as two miles away. Poor defensible space management, improperly sealed vents and openings and combustible building components will allow the embers ignite fuels near or on the structure itself.
- Direct contact by flames occurs when a fire is burning close enough to allow flames to touch an object. This will heat the building materials and, depending on the time and intensity of exposure to flames, combustible materials can ignite or, in the case of window glass, break. Broken windows are an open pathway for more embers and heat to enter into the building, accelerating the burn rate.
- Radiant heat is the energy that is transferred through the air to other objects when materials burn. If a building receives enough radiant heat for a sufficient amount of time, it will ignite without direct contact. Sometimes, radiant heat can also break the glass in windows, allowing wind-blown embers to enter the building. Even if the radiant exposure isn't large enough or long enough to result in ignition, it can pre-heat surfaces, making them more vulnerable to ignition from exposure to flame and embers. Consequently, even plant life and other fuels located away from the building can pose a threat.



Wildfire resistant construction or repair includes the use of flame- or fire-resistant external materials that can slow down or prevent fire from entering a structure. Structural features vulnerable to wildfires include:

- Roof material
- Eaves, soffits, fascia and attic vents
- Chimney
- Exterior walls
- Exterior glass
- Basement and crawlspace

Roof Material

The surface, crevices and corners of a roof are places where burning wood (firebrand) often settles and ignites. Several options exist to prevent fire damage to roofs:

- Using roofing materials or assemblies labeled Class A, which are the most fire resistant.
- Avoiding wood roofing shingles, no matter the rating or type of fire-resistant treatment.
- Avoiding chemically treated materials or coatings, which often lose their effectiveness over time and leave the roof vulnerable to fire.

Eaves, Soffits, Fascia and Attic Vents

Eaves, soffits, fascia and attic vents are at risk from both firebrands and convective heat. Mitigation techniques to protect these vulnerable sites include:

- Enclosing or “boxing” them with noncombustible materials
- Using non-combustible screening over attic vents
- Avoiding the use of PVC and vinyl materials. PVC and vinyl generally have high ignition resistance, burning resistance and flame spread resistance, which means they typically do not propagate fires. However, PVC and vinyl siding will melt and deform or fall away in relatively low temperatures, and therefore do not provide effective protection from intrusion of embers and smoke.

Chimneys

Structures with uncapped chimneys may allow firebrands to enter a structure and ignite flammable materials. This risk can be mitigated by:

- Installing a spark arrestor made from welded wire or woven wire mesh with openings less than ¼-inch wide at the top of the chimney
- Keeping the flue closed when a fireplace is not in use to further reduce the chance of firebrands entering the structure

Exterior Walls

Exterior walls are susceptible to both radiant and convective heat and can quickly transfer a ground fire to the structure’s roof. These walls can be protected by fire-resistant materials such as:

- Cement, plaster and stucco
- Concrete masonry such as stone, brick or concrete block

Avoid the use of combustible exterior cladding systems in wildfire-prone areas. These systems, such as exterior insulation and finish systems (EIFS) or metal composite materials (MCM), can contain foam insulation, which significantly aids in fire spread.

Windows, Glass Doors, Skylights and Below Grade Spaces

- Glass in windows, doors and skylights can fracture and fall out when exposed to the heat of a wildfire. This leaves an opening for flames and firebrands to enter the structure. Using double-paned or tempered glass windows reduces this risk.
- Tempered glass typically resists fracture even at temperatures well above the radiant heat needed to ignite a structure’s wood framing.
- Wind can push firebrands through the vents in a structure’s basement or crawl space. The fireproof screening used on roof vents can also be used to protect the vents in the basement or crawl space.

Wildfire Resiliency

Below are general guidelines to help your organization prepare for and respond to wildfire events.

Before a wildfire event:

- Have an incident/emergency response plan that contemplates wildfire. An annual review and exercise can increase the effectiveness of these plans.
- Distribute emergency contact telephone call lists to all employees.
- Review your business continuity plan (BCP) annually to ensure recovery plans and strategies are up-to-date. [CNA's Business Resiliency Self-Assessment](#) can help you identify opportunities to strengthen your resiliency programs.
- Post road signs and your company name and street address so they are easily visible.
- Make sure there is an easily accessible tool storage area near your facility with rakes, hoes, axes and shovels.
- Review shutdown plans for equipment and operations to ensure they reflect current conditions at the location.
- Ensure your building(s) include as much wildfire-resistant construction as possible (as discussed in the Wildfire-Resistant Construction section above).
- Ensure your defensible space is established and regularly maintained (as discussed in the Defensible Space section above).

When a wildfire threat is present:

- Monitor local and state government information distribution (e.g., websites, radio).
- Move company vehicles out of the danger area. Have employees take them home if possible.
- If possible, move combustible material away from windows in preparation for an evacuation order.
- Close all exterior windows, doors and skylights, if possible.
- If there are any valuable papers or files that have not been duplicated, keep them together in one place so they can easily be taken with you when you evacuate.
- Ensure server data is backed up off-site or backed up and taken off-site to a secure location.
- Identify modes of transportation out of the wildfire area.
- Prepare to execute the incident response plan.
- Remind employees of the incident response procedures and distribute employee telephone numbers and emergency contact lists.

When you are ordered to evacuate:

- Remove any combustible window coverings.
- Shut off gas and fuel to the building. If you have fuel tanks outside, make sure all valves supplying fuel are shut off.
- Turn off all machinery and equipment.
- Make sure your fire sprinkler system is fully in service (with control valve open) if you have fire sprinklers.
- Close and lock all doors, windows and skylights.
- Shut down HVAC equipment, especially the fans that bring outside air into the building.
- Take a call list of employees with you in case you need it, and start the process to let employees know the status of your business.
- All persons must leave the location and should not stay behind.

Resources

[OSHA Wildfires](#)

[NIFC Wildfire Outlook](#)

[NFPA Wildfire](#)

[InciWeb \(Incident Information System for monitoring wildfires\)](#)

[GACC \(Geographic Area Coordination Centers\) Website Portal, National Interagency Fire Center](#)

[Government of Canada: Get Prepared – Wildfires](#)

[CIFFC \(Canadian Interagency Forest Fire Centre\)](#)

[Canadian Wildland Fire Information System](#)

Contact your local CNA Risk Control representative for further insights on how you can assess wildfire risk at your location and reduce the risk of loss.