



## Risk Control

# How to Reduce Your Business' Risk of Wildfire Damage

Wildland fires (wildfires) are a growing threat to lives and property in Canada due to frequent drought, warmer temperatures, periodic high winds, and excessive dried vegetation in forests and grasslands. Additionally, more key infrastructure is being placed in remote locations surrounded by forest (power plants, airports and even industrial sites). The world is now seeing more frequent “mega fires,” which have wind speeds above 60 mph and cannot be stopped using traditional firefighting strategies.

Fire plays an important role in the life of a forest by clearing away dead wood and undergrowth to make way for younger trees. Prior to widespread human settlement, wildfires burned naturally and cyclically, which kept fuel loads low and restricted the bulk of wildfires to smaller areas and heat levels, while promoting overall forest resilience. Human intervention in the 20th Century began to affect this natural cycle, as forest management policies actively sought to suppress wildfires to preserve timber and real estate. This led to the accumulation of brush and other vegetation that is easily ignited and serves as fuel for wildfires. Data and experience now shows that this practice has resulted in excess fuel—there are now intense wildfires in many areas that would have experienced frequent, but low severity wildfires.

In Canada, over 8000 fires occur each year, burning over 2.1 million hectares, according to the National Forestry Database. Although all Canadian areas can be impacted by wildfires, Western Canada is home to the largest fires causing significant property damage.

One of the most expensive wildfire related disasters was the 2016 Fort McMurray fire in Alberta, creating over \$3.5 billion dollars in damages. The fire burned almost 600,000 hectares of forestry and destroyed more than 3000 structures. Data from Natural Resources Canada shows that the surge in communities forming in forested areas along with climate change has increased the risk and intensity of wildfires in those regions.

### Protecting Property from Wildfires

The two main aspects of a building's ability to resist wildfire damage are found both in 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; however, even small steps to protect property can improve a structure's ability to withstand wildfires.

### Defensible Space

A "defensible space" is an area around the structure where vegetation debris and other combustible fuels are treated, cleared, or reduced to slow the spread of wildfires towards the structure. It minimizes the chances of a structure fire spreading into surrounding forestry as well as providing clear space for firefighters to do their job effectively. This is a cost-effective way to protect a building against wildfires.

#### Area Closest to the Structure

This consists of an area with a radius of 15 to 30 feet around the primary structure, where all combustibles and flammables (e.g. vegetation, debris, storage, and miscellaneous items) that can potentially burn and strengthen a wildfire, are removed. This clear space is measured from the outside edge of building eaves and attached structures.

- Remove all materials that can burn, including trees and shrubs (etc.).
- Remove branches overhanging the roof and chimney.
- Keep grass mowed to a low height (3-4 inches).
- Remove weeds often.
- Do not store or stack combustible materials against buildings.
- Make sure the chimneys, attic, roof, eaves and foundation vents are kept in good condition. Vents should also be screened.

Locate propane tanks at least 30 feet away from any building and 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, LP gas could flow downhill into the building.

#### 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.
- Limit the number of dead trees within this area by removing them from the area whenever possible.

#### Outer Area

This is an area of traditional forest management (of no particular size) and extends from the edge of the middle area all the way to your property boundary lines.

### Wildfire Resistive Construction

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

- Embers are 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, or transported by fire far away from the actual fire. Burning embers landing on or near a structure can ignite combustible debris that can threaten the structure. Poor defensible space allows the embers to ignite material in outlying areas and spread fire to the structure.
- The direct contact by flames occurs when a fire is burning close enough to allow flames to touch an object. Direct contact by flames will heat the building materials and depending on the exposure (i.e., the time and intensity of the 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 flames and embers. Consequently, even plant life and other fuels located away from the building can pose a threat.

#### Structural Features

Wildfire resistive construction or repair includes the use of flame resistant or fire resistant external materials that can slow down or prevent fire from entering a structure. Features that create vulnerability for structures to wildfires include:

- Roof materials
- Eaves, soffits, fascia and attic vents
- Chimneys
- Exterior walls
- Exterior glass
- Basements and crawlspaces

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

- Using roofing materials labeled Class A, which are the most fire resistant.
- Avoiding wood roofing shingles, regardless of their 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 convection heat. Mitigation techniques to protect these vulnerable sites include:

- Enclosing or "boxing" them with noncombustible materials will protect these areas of a structure.
- 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 high flame spread resistance, which means they typically do not propagate fires. Although these materials will not burn, the high temperature of a fire can cause them to melt and deform or fall away, providing the fire with a direct path into the structure, e.g. vinyl windows. These materials can deform in relatively low temperatures, thus do not provide effective protection from the 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 blocks

### **DO NOT use Exterior Insulation and Finish Systems (EIFS) in wildfire prone areas.**

EIFS is an exterior cladding material and contains foam insulation, which significantly aids in fire spread.

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.

- Double-paned windows offer a second layer of protection.
- 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 crawlspace.

### **Wildfire Risk Control and Management**

In order to manage your wildfire risk, you must have a comprehensive understanding of your building's exposure to wildfire. CNA's Risk Control Department can perform a Wildfire Risk Assessment of your location to help you gain insight. Contact your local CNA Risk Control representative for further details.

Below are general guidelines to help you prepare for a wildfire event.

#### **Before a wildfire event:**

- Have an emergency response plan that includes wildfire. Ensure this plan includes regular reviews and practice drills.
- Distribute emergency contact telephone call lists to all employees, if not already done. If the procedure is not formalized, immediately develop one and implement process for emergency contacts.
- Publish a telephone tree of contact numbers and distribute to employees.
- Review your business continuity plan (BCP) and make sure your contacts, contracts, suppliers, and alternate locations are up-to-date and available.
- 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 in case of fire.
- Ensure your building(s) include as much wildfire resistive construction (as discussed in the "Wildfire Resistive Construction" section of this Risk Control Bulletin) as possible.
- Ensure your defensible space is established and regularly maintained (as discussed in the "Defensible Space" section of this Risk Control Bulletin).

**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. Having 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 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.
- Prepare to execute the emergency response plan.
- Remind employees of the emergency response procedures, distribute employee telephone numbers, and emergency contact lists.
- Identify modes of transportation out of the wildfire area.

**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**

NFPA Wildfire

<https://www.nfpa.org/Public-Education/By-topic/Wildfire>

Natural Resources Canada Canadian National Fire Database

[https://cwfis.cfs.nrcan.gc.ca/ha/nfdbProtecting\\_Property\\_from\\_Wildfires](https://cwfis.cfs.nrcan.gc.ca/ha/nfdbProtecting_Property_from_Wildfires)

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