

Safety Hazards

Wildland Fires and Smoke

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What are wildland fires?

Wildland fires are any fires that occur in forests, brush, shrubs, and grasslands. They are a natural part of the ecosystem and help maintain forest diversity and health. They may also include prescribed burns and cultural fires.

What causes wildland fires?

Wildland fires are most often started by lightning strikes or by human activity. Between early April and late October, many regions of Canada enter wildland fire season. Hundreds of fires may be burning at one time, and the fires will vary in size.

Instances of wildland fires and their impacts may increase with climate change. According to Natural Resources Canada, climate change is expected to increase the frequency of fires in many boreal forests, and fire-prone conditions are predicted to increase across Canada.

For more information on climate change and the workplace, please see our various OSH Answers on [climate change](#).

How are wildland fires controlled?

It is important to know that not every wildland fire should be controlled or needs to be extinguished (“put out”). Many wildland fires will burn out themselves, or the weather will change to bring rain and high humidity that can slow or extinguish the fire. Across Canada, forest management agencies evaluate each fire to balance the benefits that come from the fires while limiting potential damages and costs. Many ecosystems require fire, for example, to open seed cones (jack pine cones). The fire also releases nutrients to the soil and may remove diseased plants and harmful insects.

Wildland fire crews are trained to Canadian Interagency Forest Fire Centre (CIFFC) standards. This standardized training allows wildland fire crews to be mobilized across Canada through mutual aid agreements.

What are the hazards associated with wildland fire smoke?

Wildland fire smoke contains particles and gases that may be harmful to workers or the community. Smoke is a complex mixture of hundreds of chemicals. It may contain:

- Fine particulate matter
- [Carbon monoxide](#)
- [Carbon dioxide](#)
- Nitrogen oxides
- Sulfur oxides
- Volatile organic compounds
- Formaldehyde

The composition of smoke will depend on many factors, including what materials are burning. The concentration of the smoke will depend on the wind conditions and proximity (closeness) to the fire.

What are the health effects of wildland fire smoke?

Smoke may cause irritation of the eyes, nose, and throat, as well as headaches and worsening of allergies. Inhaling fine particles of smoke has been linked with the aggravation of pre-existing respiratory and cardiovascular diseases.

Symptoms of smoke exposure may include shortness of breath, persistent coughing, wheezing, chest tightness, and increased mucous production.

For most healthy workers, symptoms are temporary and will resolve when the air clears or when indoors with clean air. However, during smoke events, accommodations may be required to help reduce the risk of adverse health effects.

Routinely check the [Air Quality Health Index](#) (AQHI) or other indicators of smoke levels in your community, as well as wind speed and direction. During smoke events, it may be necessary to reduce strenuous activities outdoors and keep all windows closed. (It may be necessary to limit the time your pets stay outside as well.)

WorkSafeBC states that some people have expressed concerns about the long-term health effects of smoke inhalation, such as an increased risk of cancer (when the smoke contains products such as hydrocarbons or formaldehyde) or other chronic health problems. In general, however, WorkSafeBC states that the long-term health risks from short-term exposure (i.e., days to weeks) are quite low for those living in an area where there is wildland fire smoke at low or moderate levels.

The potential for harmful health effects depends on the level and duration of exposure, age of the person, individual susceptibility, and other factors. For these reasons, not everyone exposed to smoke will be affected in the same way. Smoke is more likely to affect:

- Young children
- Older adults
- Pregnant women
- Individuals with respiratory and heart conditions (e.g., asthma, bronchitis, emphysema, etc.)
- Individuals participating in strenuous physical activities (e.g., work or sports)

If you do not feel well, contact your healthcare practitioner. For any other medical emergency, call emergency services (such as 911).

Who is at risk?

Smoke can affect individuals in both communities and workplaces. Smoke can travel hundreds of kilometres.

People working outdoors may notice health effects, including workers in industries such as:

- Construction
- Agriculture
- Forestry
- Landscaping
- Mining

- Transportation
- Delivery services, etc.

Wildland fire smoke may also affect other individuals. For example, indoor workers may be exposed if smoke is introduced into the building through open windows or inefficient heating, ventilation, and air conditioning (HVAC) systems and air filters.

What can the workplace do to protect workers?

There are several steps you can take to protect workers when there is smoke in the air. Employers should:

- Monitor the Air Quality Health Index and other indicators of smoke levels.
- Be sure ventilation systems and air filters are maintained to remove smoke particulates which will help provide clean air to work areas.
- Include wildland fires as a factor in the emergency response and business continuity plans if wildland fires are common in the region.
- Implement procedures to monitor and respond to wildland fires and smoke, including the possibility of evacuation.
- Investigate any work-related incidents.
- Provide or call for medical assistance when workers have severe symptoms. Any worker who has difficulty breathing should reduce or stop their activities and notify their supervisor. It may become necessary to temporarily relocate the worker to an area with cleaner air or reschedule the work when the air quality improves.

Workers should be trained on smoke or fire procedures and be aware of what to do during an emergency or evacuation. Supervisors should be kept informed and communicate the hazards to the workers.

Wildland fire season in Canada also occurs when the weather is the hottest. This fact means that workers may be exposed to both smoke and extreme heat. Follow a [heat stress program](#) and consider the added stress due to reduced air quality. When it is not possible for workers to spend time in cooler and cleaner air, provide access to water and encourage them to drink regularly. Even if they do not feel thirsty, drinking water helps to moisten the nose and mouth, which in turn helps the body remove some of the particulates.

Employers should check in regularly with workers about their mental and physical health. Wildland fire and smoke events can be mentally and emotionally challenging. Feeling anxious, stressed, sad, or isolated is not uncommon, but eating well, getting enough sleep, exercising indoors, and staying in contact with friends can help. Remind workers of the support offered by the organization, like an [Employee Assistance Program](#) (EAP), and encourage anyone having trouble coping with stress, anxiety, or depression to seek help. Remember to check in with workers and other people who are in your care or live nearby who may be more vulnerable to poor air quality.

What can the workplace do to support the community?

Workplaces may have resources and personnel that can help with evacuation efforts or community protection. For example, workplace emergency response teams may be able to volunteer to stay and support the wildland fire crews or volunteer firefighters by providing additional personnel or equipment, assisting with traffic control, etc. Workplaces may also be able to provide supplies such as food, water, and lodging to those who must stay in the community.

It is important to note that offering support is voluntary, and the safety of workers should be the workplace's priority.

How can I prevent wildland fires?

If you live or work near forested areas, be informed about the dangers of wildland fires, how to prevent fires from spreading, and how to reduce the risk to your home and community.

Before you light a campfire, always check if campfires are currently permitted.

- Never build a campfire in dry, windy conditions or if there is a fire ban in the area.
- Never drop sources of ignition (such as lit cigarettes or cigars) out a car window or into the forest.

When having a campfire, always:

- Check municipal bylaws to see if permits are required or if there is a fire ban in the area.
- Choose a location that is at least 4.5 metres (15 feet) away from all tents, shrubs, and trees. Remove any twigs or leaves in the area. Do not forget to consider any low-hanging branches above the fire pit.
- Check the weather conditions, including temperature, humidity, wind direction, and wind speed, before lighting a fire.
- Circle the pit with rocks, a metal barrel, or a rim.

- Keep the fire a manageable size.
 - Never leave a fire unattended.
 - Allow the wood to burn down completely to ash.
 - Always extinguish the fire before leaving. Drown all the embers, not just the red ones. Stir the embers to make sure all are extinguished. Add water until the hissing sound stops and the embers are no longer giving off heat.
 - Never burn aerosol cans or pressurized containers. These items may explode and spread the fire.
 - Do not add flammable liquids to the fire (e.g., spraying bug spray or pouring gasoline on the fire).
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How can I prepare for wildland fire season?

If you live in a region at risk of wildland fires, make sure to plan and be prepared. Being prepared will not only improve a workplace or community's response but also will aid in the recovery after a fire.

Your municipal office and fire department may have more information on how to prepare for the risks of wildland fire and the protocols in place if there is a fire in or near the community.

During fire season, individuals can consider the following, in addition to any local guidelines:

- Prepare an emergency supply kit that includes important documents, personal identification, phones and chargers, and medications.
- Be aware of fire ratings, if a fire is allowed, active fires in the region, and public notices about the fire's location or smoke events.
- Use HEPA (high-efficiency particulate air) filters and maintain filters as instructed by the manufacturer.
- Remove flammable materials (e.g., wood piles, propane tanks, etc.) and any dead vegetation that is within 3 metres (10 feet) of your home, including leaves and debris from gutters, porches, and decks.
- Replace any loose or worn roof shingles to prevent any embers from settling onto the roof.
- Create an emergency plan which includes what to do in the event of an evacuation. Practice with everyone in your home.
- Choose a meeting place or establish a common contact (a person who is away from the fire zone) if you must leave your home and have a way to contact friends or family. Plan alternative routes.

What happens if there is a need to evacuate?

Wildland fires can spread quickly and when they threaten communities and services, individuals may need to evacuate without much notice.

If there is a wildland fire in your area, monitor the local media and fire department websites, listen to the radio, and stay informed.

Plan ahead. Have an emergency plan. Write down your key contacts and their information. Know who you can contact if you need support.

Anticipate how you might feel or react in this situation. Take steps to prepare yourself for the stress and anxiety. Being forced to leave your home can result in a range of emotions, including grief, sadness, uncertainty, helplessness, excessive anxiety, anger, emotional numbness, difficulty making decisions, and confusion. Everyone reacts differently. If these feelings are overwhelming or last for a long time, [reach out for help](#).

If an evacuation order is expected, keep pets and family close. Make sure your vehicle has enough fuel, and pack your emergency supply kits and any other valuables.

Move flammable items such as patio and deck furniture, door mats, and wooden plant pots indoors or as far away from the house as possible. Close all openings into your home including attic vents, windows, and doors.

Once evacuation orders have been given, do not stay longer than you need to. The evacuation alert should include details about check-in points outside of the community, places to stay (such as community centres in neighbouring municipalities), and where to meet for alternate transportation and times for those who cannot leave on their own.

During and after the evacuation, try to focus on what is within your control. Try to maintain your daily routine or do things that make you feel happy. Try to connect with your family, friends, or social support network. Learn what services are available to help your physical and mental health. Seek professional help if feelings become overwhelming or if you have difficulty carrying on with your usual responsibilities.

If you are susceptible to the health effects of wildland fire smoke and smoke levels in your community are high, evaluate if it is possible to temporarily relocate to an area with cleaner air. You may also choose to leave your community before an evacuation order is issued.

Continue to listen to news updates for information about the fire throughout the evacuation. Only return home when the authorities say it is safe to do so.

How do I report a forest fire?

Each province or territory is responsible for responding to a wildland fire, with cooperation from local authorities. A list of contacts is available from the [Government of Canada](#).

Where can I get more information?

More information is available from:

- Canadian Red Cross: [Wildfire Basics](#)
- Government of Canada:
 - Wildfires - Get Prepared
 - [Wildfires in Canada: Toolkit for Public Health Authorities](#)
- WorkSafeBC: [Wildfire Smoke: Frequently Asked Question](#)
- Natural Resources Canada: Canadian Wildland Fire Information System [National Wildland Fire Map](#)

(*We have mentioned these organizations as a means of providing a potentially useful referral. You should contact the organization(s) directly for more information about their services. Please note that mention of these organizations does not represent a recommendation or endorsement by CCOHS of these organizations over others of which you may be aware.)

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