Institute for Catastrophic Loss Reduction

Building resilient communities

Designed for safer living®

FireSmart™ Canada

Protect your home from

Wildfire

Designed for safer living® *is a program endorsed by Canada's insurers to promote disaster-resilient homes.*

FIRESMART BEGINS AT HOME GUIDE

About the Institute for Catastrophic Loss Reduction

The Institute for Catastrophic Loss Reduction (ICLR), established in 1997, is a world-class centre for multidisciplinary disaster prevention research and communication. ICLR is an independent, not-for-profit research institute founded by the insurance industry and affiliated with Western University.

The Institute's mission is *to reduce the loss of life and property caused by severe weather and earthquakes through the identification and support of sustained actions that improve society's capacity to adapt to, anticipate, mitigate, withstand and recover from natural disasters.*

ICLR's mandate is to confront the alarming increase in disaster losses caused by natural hazards and to work to reduce disaster deaths, injuries and property damage. Disaster damage has been doubling every five to seven years since the 1960s, an alarming trend. The greatest tragedy is that many disaster losses are preventable. ICLR is committed to the development and communication of disaster prevention knowledge. For the individual homeowner, this translates into the identification of natural hazards that threaten them and their home. The Institute further informs individual homeowners about steps that can be taken to better protect their family and their home.

The purpose of this handbook is to outline actions that homeowners can take to protect their homes from wildfire damage. Some of these measures are simple and free; others cost money. All contribute to reducing the risk of wildfire damage.

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To find out more about CIFFC and FireSmart™ contact:
general@firesmartcanada.ca

Wildland fire reality

Wildland fires are a natural part of our ecosystems. Without them, the landscape loses its diversity. Wildland fires recycle nutrients, help plants reproduce, and create a mosaic of vegetation that provide habitats for a variety of wildlife.

By extending our lifestyles and communities further into forested areas, also referred to as the Wildland Urban Interface, we become more exposed to the danger of wildland fire, and this may put your home at risk. It is possible, however, to live safely with this natural event! The recommendations in this guide will help you reduce the risk of wildland fire to your home and neighbourhood.

Wildland urban interface

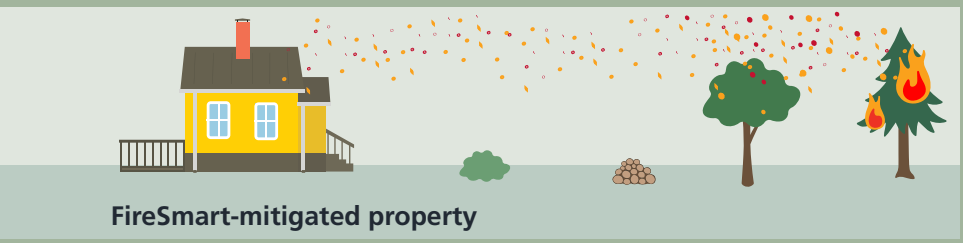
The Wildland Urban Interface (WUI) is the area where human development meets or intermingles with the natural environment. Over time, our communities and lifestyles increasingly extend further into forested areas. As such, we find interface communities all over Canada in both remote rural locations, and in urban centres. When we live, work, and play in WUI zones, we become more exposed to the danger of wildland fire, but it is possible to live safely with this natural event.

Wildland fuels and built fuels all have different burning characteristics. When combined, they create uniquely complex conditions that affect the ignition and spread of fire that are very different than the conditions created by an isolated structural or wildland fires. This is called the WUI fuel complex. By understanding the complexities of these combined fuels, along with considering the topographic and weather conditions that affect the combustibility of these fuels, we can better appreciate the unique and often overwhelming challenges that a WUI fire presents, especially when it comes to suppression attempts.

Understanding fire behaviour

Fire + Fuel = Why homes burn

Unmitigated property



FireSmart-mitigated property

Fuels include trees, woodpiles, structures, fences, plants, etc.

How wildland fires spread

Embers & sparks

Embers and sparks can blow up to two kilometres ahead of a wildland fire. They can ignite materials on or near your home causing severe damage.

Extreme heat

Radiant heat from a wildland fire can melt vinyl siding, ignite your home, and even break windows. Extreme heat can come from flames within 30 metres of your home.

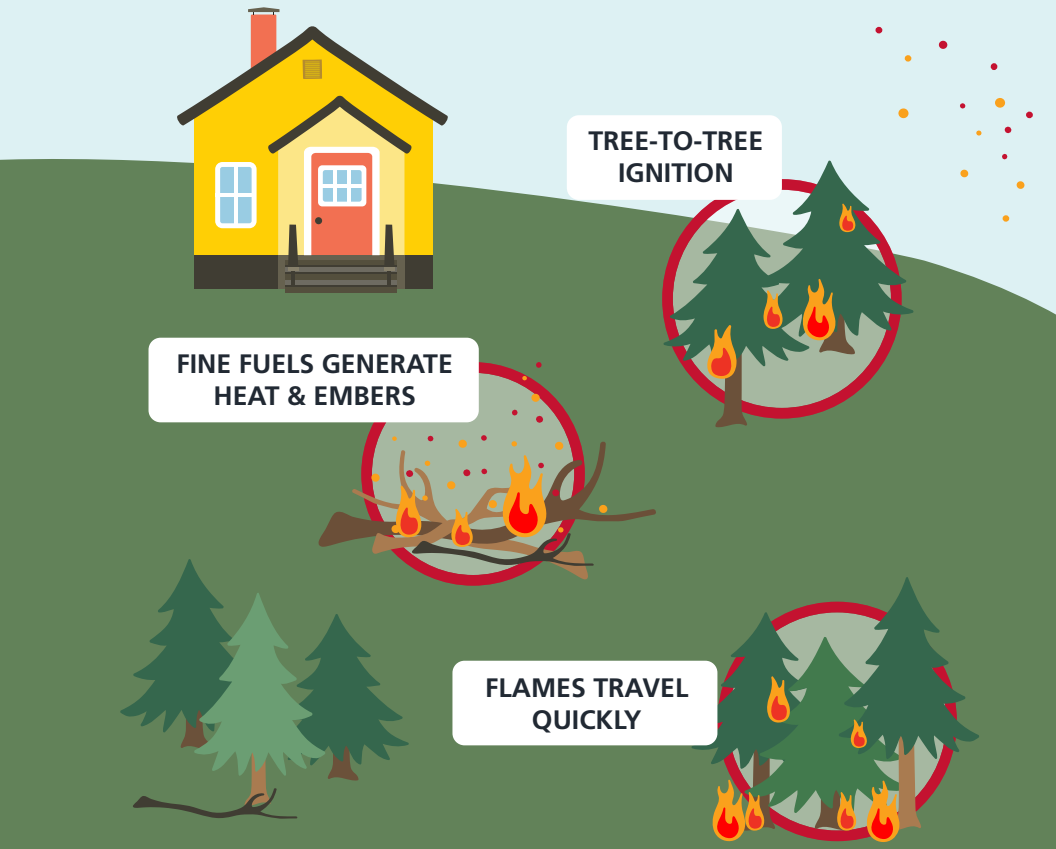
Direct flame

As wildland fires spread toward homes, they ignite other flammable objects in their path. To stop wildland fire from directly affecting your home, create breaks in this path, especially close to your home.

Factors influencing the spread of wildland fire

Dense continuous forests

Wildland fire can spread quickly in forests where trees are near each other. Fire spreads directly from tree to tree, and can produce sparks and embers that may travel distances of two kilometres. These embers may land on trees or homes well ahead of the fire and create multiple fire situations. It is important to be aware of the dangers of sparks and embers when creating a FireSmart property.



Coniferous trees are highly flammable.

Deciduous trees are less flammable.

Slope

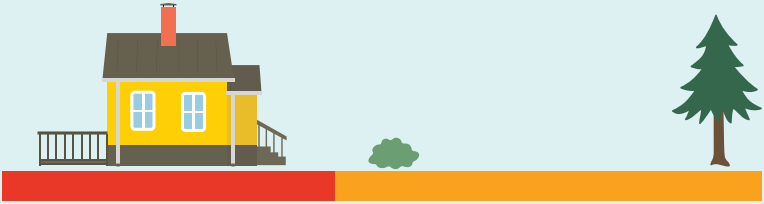
Fire moves fastest uphill. The steeper the slope, the faster a wildland fire will spread. Homes on hills, or at the top of hills, face the greatest risk from wildland fire. If your home is located on a hill, consider taking extra measures, like removing trees adjacent to the slope and planting fire resistant plants. If you are planning to build a new home, consider having it set back at least 10 metres from the crest of any hill or slope, as well as the landscaping around it. Maintain a 1.5 metre non-combustible surface in the Immediate Zone, including any attachments, such as decks.

How FireSmart treatments influence the spread of wildland fire

Wildland fire can follow a path from the forest or grassland to your home. A wildland fire moving via the tops of trees can be slowed if the trees are spaced. It can be further slowed by flame-resistant plants and shrubs in your yard. As plants have different flammability, consider spacing your plants to increase your home's ability to withstand a wildland fire.

Yard spacing

Changes within 10 metres of your home will have the biggest impact.

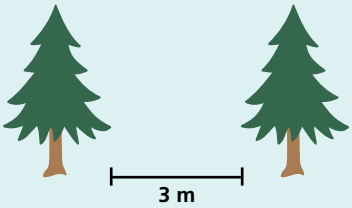


Immediate zone
0 m to 1.5 m

Intermediate zone
1.5 m to 10 m

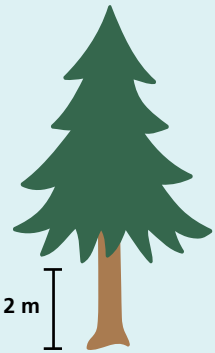
Tree spacing

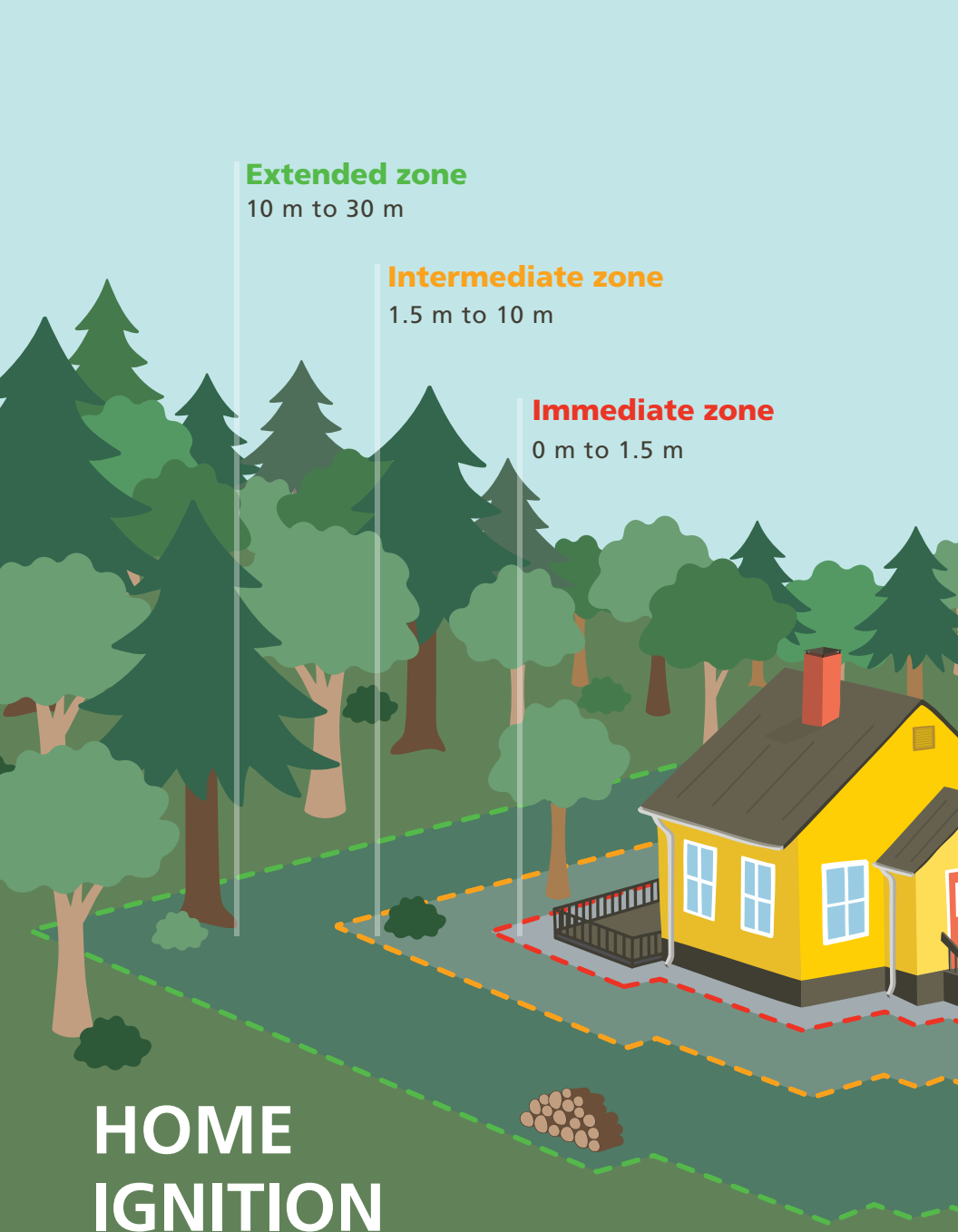
Spacing trees at least 3 metres apart will help reduce the intensity of a wildland fire.



Prune trees

Prune all tree branches within 2 metres from the ground.





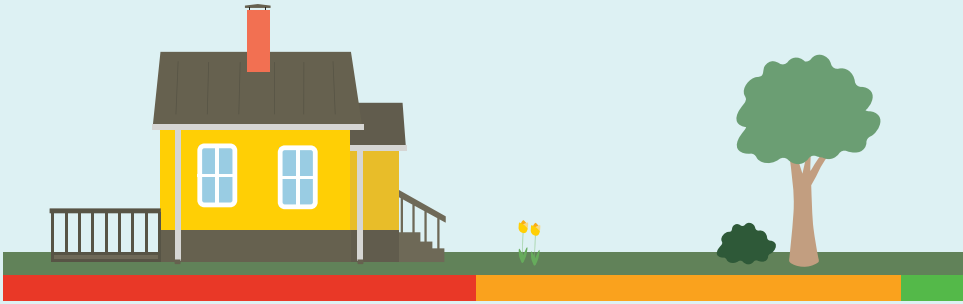
HOME IGNITION ZONE

The Home Ignition Zone (HIZ) is the area within 30 metres of your home and structures. It is made up of three priority areas: The Immediate Zone, Intermediate Zone, and Extended Zone.

The HIZ shows how you can minimize your home and property's vulnerability to wildland fire by addressing threats in each of the three priority zones, starting with the most vulnerable area, the Immediate Zone, and working your way outward.

Begin your FireSmart journey

Each section of this guide will help you to focus on the changes that protect your home from wildland fire. Start from your home and work your way outward. Changes made to the area closest to your home, and your home itself, have the greatest impact in reducing your risk of wildland fire damage.



Immediate zone

0 m to 1.5 m

A minimum 1.5 metre non-combustible surface should extend around the entire home and any attachments, such as decks.

Intermediate zone

1.5 m to 10 m

This should be a fire-resistant area, free of all materials that could easily ignite from a wildland fire.

Making the most of your time

Home renovations and upgrades can be costly and time-consuming. FireSmart principles focus on what is realistic for you to achieve to limit the risk of wildland fire to your home. Integrate FireSmart into your long-term renovation plans and incorporate regular yard cleanup to reduce your risk of damage from wildland fire.

Extended zone

10 m to 30 m

Thin and prune evergreen trees to reduce hazards in this zone. Regularly remove accumulations of fallen branches, and dry grass/needles to eliminate potential surface fuels.

Look for opportunities to create a fire break by creating space between trees and vegetation. Thinning and pruning is effective here as well. These actions will help reduce the intensity of a wildland fire.

Immediate zone

0 m to 1.5 m

The Immediate Zone is a non-combustible area that starts at the house and extends to a 1.5 metre perimeter around the home and attached structures, including decks. Reduce the chance of wind-blown embers igniting your home by starting with proactive measures outlined in this guide.

Doors

All doors into your home should be fire-rated and have a good seal. This is true for your garage doors, as well as entry doors.

Windows

Tempered or thermal (multi-paned) windows are recommended. Single-pane windows provide little resistance to heat from an advancing wildland fire.

Roof

Material

A Class-A fire-rated roof assembly offers the best protection. Metal, asphalt, clay, and composite rubber tiles are all options. Untreated wood shakes create a dangerous combination of combustible material and crevices for embers or sparks to enter. Refer to manufacturers' guidelines to maintain the fire resistance of your roof.

Maintenance

Every inside-corner of your roof is a place where debris and embers can collect. Regularly clean your roof of combustible materials.

Siding

Stucco, metal, brick, concrete, and fiber cement siding offer superior fire resistance. Logs and heavy timbers are also reasonably effective. Untreated wood and vinyl siding offer very little protection against wildland fire.

Gutters

Regularly remove debris from your gutters, as sparks and embers can easily ignite these dry materials. Consider screening your gutters with metal mesh to reduce debris that can accumulate.

Decks

It is important to sheathe-in the base of decks, balconies, and houses, as embers and sparks can collect under these spaces. Use fire-resistant material to reduce the risk of sparks and embers from igniting your home.

Chimney

A spark arrestor on your chimney will reduce the chance of sparks and embers from escaping and starting fires.

Ground-to-siding clearance

Siding is vulnerable when it ignites and when flames or embers get into the cavity behind it. With inadequate ground-to-siding clearance, accumulated embers can ignite combustible siding directly. 15 centimetres of ground-to-siding non-combustible clearance is recommended.

Eaves and vents

While vents play an important role in removing moisture from attics, they create an opening for sparks and embers. Install vents made of non-combustible material with 3 millimetre screening, or ASTM fire-rated vents. Open eaves also create a surface for embers and direct heat. Properly fitted soffits and fascia help to reduce the risk of embers and heat from reaching the wooden rafters of your home.

Other

Attachments to your home
Wooden fences or boardwalks create a direct path from the fire to your home. Separating your house from a wooden fence with a metal gate can slow the advance of fire. Remember to cut the grass along your fence line, as long, dry grass easily ignites.

Sheds and outbuildings
Give sheds and outbuildings the same FireSmart considerations as you do for your home.

Intermediate zone

1.5 m to 10 m

Elements in the Intermediate Zone are managed so they don't transmit fire to your home. There are many actions you can take to reduce your home's vulnerability in the Intermediate Zone.

YOUR YARD

Implementing FireSmart principles to your regular yard work routine will make a big impact in reducing your risk to wildland fire. Measures taken within 10 metres of your home will have the biggest impact. Fire embers may seem small, but should not be underestimated. An estimated 90% of homes damaged or destroyed by wildland fire are ignited by sparks and embers. Regular maintenance and cleaning in the corners and crevices of your home and yard where needles and debris build up will leave nothing for embers to ignite. Remember to remove any windblown leaves under decks, as well as any flammable debris from balconies, and patios. Maintain a 1.5 metre non-combustible surface around your home and any attachments, like decks.

Landscaping within 10 metres

A FireSmart yard includes making smart choices for your plants, shrubs, grass, and mulch. Selecting fire-resistant plants and materials can increase the likelihood of your home surviving a wildland fire.

Plant low-density, fire-resistant plants and shrubs. Avoid having any woody debris, including mulch, as it provides potential places for fires to start. Make sure that you maintain a 1.5 metre non-combustible zone around your entire home and any attachments.

Characteristics of fire-resistant plants

- Moist, supple leaves
- Accumulates minimal dead vegetation
- Water-like sap with little odour
- Low amount of sap or resin material

Characteristics of highly flammable plants

- Leaves or needles are aromatic
- Accumulates fine, dry, dead material
- Contains resin or oils
- Loose, papery, or flaky bark

Plants to avoid

- Cedar
- Juniper
- Pine
- Tall grass
- Spruce

Grass

A mowed lawn is a fire-resistant lawn. Grasses shorter than 10 centimetres in height are less likely to burn intensely.

Bark mulches are highly flammable.

Firewood piles should be stored at least 10 metres from your home.

Bark mulch and pine needles

Do not use bark or pine needle mulches within 10 metres of your home, as they are highly combustible. Gravel mulch and decorative crushed rock mulch significantly reduce the risk of wildland fire.

Firewood piles

Wood piled against a house is a major fire hazard. Moving your firewood pile may be the factor that allows your home to survive a wildland fire. Move firewood piles to the Extended Zone (10 – 30 metres from your home), or into a FireSmart-mitigated building.

Burn barrels and fire pits

Burn barrels should be placed as far as possible from structures and trees. Keep the area within 3 metres of the burn barrel free of combustible material. Always ensure that your burn barrel has proper ventilation and is screened with 6 millimetre or finer wire mesh.

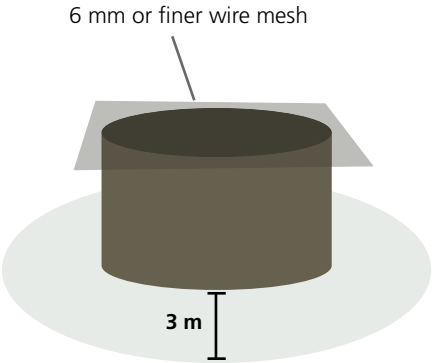
Check with your local municipality regarding specific requirements and restrictions for backyard fire pits. Fire permits for both burn barrels and fire pits are required in many jurisdictions.

Power lines

Power lines should be clear of branches and other vegetation. Contact your local utility company to discuss removing any branches or vegetation around overhead electrical installations.

On-site fire tools

Every home should have readily accessible shovels, rakes, axes, garden hoses, sprinklers, and ladders to assist in suppressing wildland fires.



Maintenance

- Include debris clean-up in spring and fall as part of your yard maintenance.
- Dry leaves, twigs, and branches are flammable and should be removed from your yard and gutters.
- Older deciduous trees can have rot and damage that make them susceptible to wildland fire. An arborist or forester can help assess the condition of mature trees.
- Remove combustible shrubs from the drip line of trees.

Remove debris easily ignited by sparks and embers.

Trees

A FireSmart yard can include trees. We often choose to live surrounded by the natural environment, and trees are a cherished part of our relationship with nature. By following the recommendations in this guide, you can have a lush, green yard that is also resistant to wildland fire.

Trees to plant

Deciduous trees (leafy) are resistant to wildland fire and include:

- Poplar
- Birch
- Aspen
- Cottonwood
- Maple
- Alder
- Ash
- Cherry

Trees to avoid

Coniferous trees (with cones and needles) are highly flammable and should not be situated within 10 metres of your home. These include:

- Spruce
- Fir
- Pine
- Cedar

Extended zone

10 m to 30 m

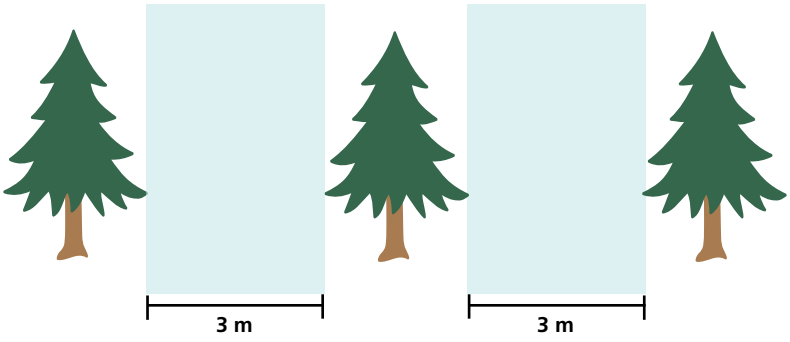
The goal in the Extended Zone is not to eliminate fire, but to reduce its intensity. If your property extends into this zone, there are many proactive measures you can take.

Tree-to-tree spacing

Once fire moves into the treetops, it can easily move into neighbouring trees and increase the overall intensity of the fire. Spacing trees at least 3 metres apart will reduce the risk of this happening.

Coniferous tree spacing

Because coniferous trees are particularly flammable, it is important to measure the distance between the outermost branches of these trees. There should be a minimum of 3 metres between them.



Tree pruning

A surface fire can climb trees quickly. Removing all branches within 2 metres from the ground will help stop surface fires from moving into the treetops. Pruning all trees within 30 metres of your home is recommended. If possible, prune all trees within 100 metres of your home.

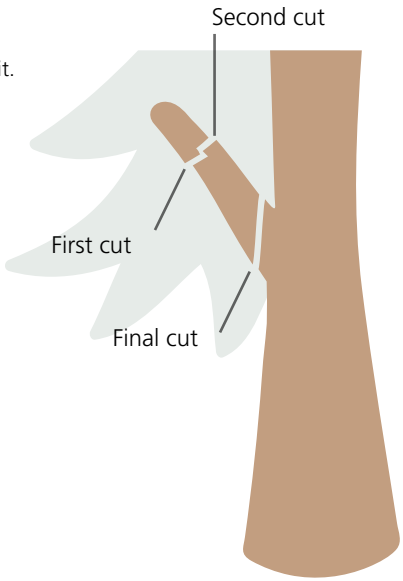
When to prune

You can prune dead branches at any time of year, but it is best to prune coniferous trees in late winter when they are dormant.

How to prune

Prune branches close to the tree trunk, but not so close that you damage the main trunk and bark of the tree.

Never remove more than ⅓ of the canopy of a tree. Doing so may harm it.



Prune branches within 2 metres from the ground.

Large yards

30 m+

Taking FireSmart actions beyond 30 metres from your home will influence how a wildland fire approaches your home. You can change the dynamics of wildland fire behaviour by manipulating vegetation in this space. FireSmart treatments within the Immediate, Intermediate, and Extended Zones can influence the amount of work necessary beyond 30 metres.

Just as in the other zones, slope is a consideration. If your home is on a slope, consider extending this area further, as fire moves fastest uphill. Factor in slope stability when removing trees.

The goal in this area is to reduce the intensity and rate of spread of a wildland fire. This is done by thinning and pruning coniferous trees and reducing excess vegetation and branches.

- Remove low-hanging branches within 2 metres from the ground.
- Space trees 3 metres from branch tips to reduce the intensity and rate of spread of fire.
- Remove smaller evergreen trees that can act as a ladder for fire to move into the treetops.
- Clean woody debris and combustible shrubs from the ground.

Roadways and driveways

In an emergency, you and your family may need to leave your neighbourhood while emergency responders enter. In order for this to happen safely and efficiently, consider the following tips:

- Clearly mark your address.
- Clear vegetation from access routes to and from your home. Target trees and branches that would make it difficult for a fire truck to approach your home.
- If you have a large property, make sure your driveway has a spot to turn around and, when possible, provide two access routes to your home.

FireSmart in your neighbourhood

Many of the recommendations in this guide assume that you have direct control over the property within 30 metres of your home. Even if that is not the case, FireSmart recommendations still apply. Chat with your neighbours about FireSmart. Shared information, along with mutual cooperation and planning can help.

The FireSmart Canada Neighbourhood Recognition Program recognizes neighbourhoods that:

- Complete a neighbourhood hazard assessment and create a FireSmart plan
- Organize a local FireSmart committee
- Work with a Local FireSmart Representative to host a FireSmart event, like a clean-up day
- Contribute in-kind or provide monetary support toward FireSmart actions

Concerned about your community's risk to wildland fire? Ask your elected official, planning department, or fire service about how they are integrating FireSmart into their plans.

HOME IGNITION ZONE

SELF-ASSESSMENT

How resilient to wildland fire is your home and property? Walk around your home and answer the questions below. Then consider implementing the recommended actions as you perform maintenance and renovations in each of the three Home Ignition Zones.

Immediate zone

0 m to 1.5 m

The Immediate Zone should be a non-combustible area that starts at the house and extends to a 1.5 metre perimeter around the home and any attachments. Treat outbuildings to the same standards as your home.

1. Does the structure have acceptable fire-rated roofing material?

YES ☐

NO ⇨

A Class-A fire-rated roof assembly offers the best protection. Metal, asphalt, clay, and composite rubber tiles are all options. Untreated wood shakes create a dangerous combination of combustible material and crevices for embers or sparks to accumulate and enter. Refer to manufacturers' guidelines to maintain the fire resistance of your roof.

2. Are the roof and gutters non-combustible and clean of debris?

YES ☐

NO ⇨

Every inside-corner of your roof is a place where debris and embers can collect. Regularly check and clean combustible debris, like needles and leaves, from the roof and gutters. Consider installing commercial screens or covers over gutters to reduce debris accumulation.

3. Are the eaves enclosed?

YES ☐

NO ⇨

Open eaves create a surface for embers and radiant heat. Consider enclosing eaves with properly fitted soffits and fascia to reduce the risk of embers and heat from reaching the wooden rafters of your home.

4. Are the vents non-combustible and screened?

YES ☐

NO ⇨

Unscreened vents can allow embers to enter a building. With the exception of dryer vents, install non-combustible vents with 3 mm metal screening in order to limit embers from accessing your home. Ensure dryer vents are clean and operational.

5. Is exterior siding non-combustible or ignition-resistant?

YES ☐

NO ⇨

Some types of construction material, like vinyl siding, can melt when exposed to high temperatures allowing the fire to reach the underlying wall components and penetrate the interior of the building. Stucco, metal, brick, concrete, and fibre cement siding offer superior fire resistance.

6. Is exterior siding free of gaps, holes, or other areas where embers can accumulate?

YES ☐

NO ⇨

Examine your siding for locations where embers could accumulate or lodge. Be sure to fix any holes and gaps in exterior siding in order to prevent embers from igniting your home.

7. Are windows multi-pane or tempered glass?

YES ☐

NO ⇨

Single pane glass windows are highly vulnerable to breakage from radiant heat exposures that can occur during wildland fires. Multi-pane windows are less vulnerable and tempered glass windows are least vulnerable.

8. Are exterior doors non-combustible, or fire-rated?

YES ☐
NO ⇨

All doors into your home should be fire-rated, or non-combustible and have a good seal. This is also true for garage doors.

9. Are exterior walls protected with a minimum 15 cm vertical non-combustible ground-to-siding clearance?

YES ☐
NO ⇨

Creating a non-combustible vertical ground-to-siding clearance can be achieved by lowering the level of the ground to expose the foundation walls. It can also be achieved by replacing the first 15 cm of combustible siding with non-combustible siding material or flashing. This will limit the risk of siding igniting as a result of ember accumulation at the base of the building.

10. Is the deck/porch enclosed?

YES ☐
NO ⇨

Consider enclosing the underside of the deck or porch with non-combustible sheathing, as this will act as a shield against embers. Moving combustible materials stored underneath the deck to the Extended Zone, or storing inside a FireSmart-mitigated building, will limit potential for those materials to ignite.

11. Is the deck/porch made with fire-rated materials?

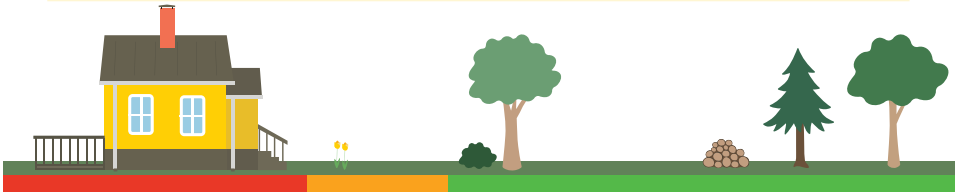
YES ☐
NO ⇨

Non-combustible, or fire-rated deck or porch materials are ideal when it comes to reducing your wildland fire risk. A non-combustible surface should be under the deck and extend for 1.5 metres out from its perimeter.

12. Are there combustible materials and landscaping products immediately surrounding your home?

YES ☐
NO ⇨

Reduce the chance of wind-blown embers igniting materials near your home. A non-combustible surface should extend around the structure and any attachments such as decks. Creating a non-combustible surface can be as easy as clearing flammable materials and vegetation. No grass or plants of any type should be present in this zone.



Immediate zone
0 m to 1.5 m

Intermediate zone
1.5 m to 10 m

Extended zone
10 m to 30 m

Intermediate zone

1.5 m to 10 m

Elements in the Intermediate Zone are managed so they don't transmit fire to your home.

1. Is the lawn cut to a length of 10 cm or less?

YES ☐

NO ⇨

Mowing and maintaining the lawn to a height of 10 cm or less will limit flame intensity and/or spread.

2. Is the yard free of combustible debris?

YES ☐

NO ⇨

Regularly remove accumulations of combustible debris like needles, leaves, and branches. Ensure that all combustible materials, like woodpiles, building materials, patio furniture, recreation vehicles etc., are moved into the Extended Zone, or a FireSmart-mitigated building.

3. Are garden beds lined with crushed rock/decorative gravel?

YES ☐

NO ⇨

Organic mulch like bark or pine needles are highly combustible. Crushed rock or decorative gravel significantly reduce the risk of damage from wildland fire.

4. Does landscaping include fire-resistant plants?

YES ☐

NO ⇨

Create a landscape that will not easily transmit fire to your home. Selecting fire-resistant plants can increase the likelihood of your home surviving a wildland fire.

5. Are coniferous trees pruned to a height of 2 metres?

YES ☐

NO ⇨

A surface fire can climb trees quickly. Removing all coniferous branches within 2 metres from the ground will help stop surface fires from moving into the treetops.

6. Are coniferous trees spaced at least 3 metres apart?

YES ☐

NO ⇨

Spacing coniferous trees at least 3 metres apart from crown-to-crown will reduce the risk of tree-to-tree fire transmission.

Extended zone

10 m to 30 m

The focus in the Extended Zone is not to eliminate fire, but to reduce its intensity.

1. Are all firewood piles and other combustible materials located within the Extended Zone?

YES ☐

NO ⇨

Firewood and combustibles are major fire hazards. Moving all combustible material into the Extended Zone, or into a FireSmart-mitigated building, is critical to reducing wildland fire risk.

2. Are coniferous trees pruned to a height of 2 metres?

YES ☐

NO ⇨

A surface fire can climb trees quickly. Removing all coniferous branches within 2 metres from the ground will help stop surface fires from moving into the treetops.

3. Are coniferous trees spaced at least 3 metres apart?

YES ☐

NO ⇨

Spacing coniferous trees at least 3 metres apart from crown-to-crown will reduce the risk of tree-to-tree fire transmission.

4. Have accumulations of fallen branches, dry grass, and needles on the ground been removed?

YES ☐

NO ⇨

Cleaning up accumulations of fallen branches, dry grass, and needles will reduce potential surface fuels.

What's next?

The Home Ignition Zone Self-Assessment is a great step to help you on the path to wildland fire resiliency, but there are many factors that can influence your level of preparedness! So, what else can you do to be prepared?

- Take FireSmart 101, our free online course, for a deeper dive into FireSmart and how homes ignite.
- Create an evacuation plan. Find the Last–Minute Checklist on our website.
- Contact your FireSmart Liaison or Local Program Coordinator for a professional assessment of your home or neighbourhood.
- Reach out to **general@firesmartcanada.ca** with any questions.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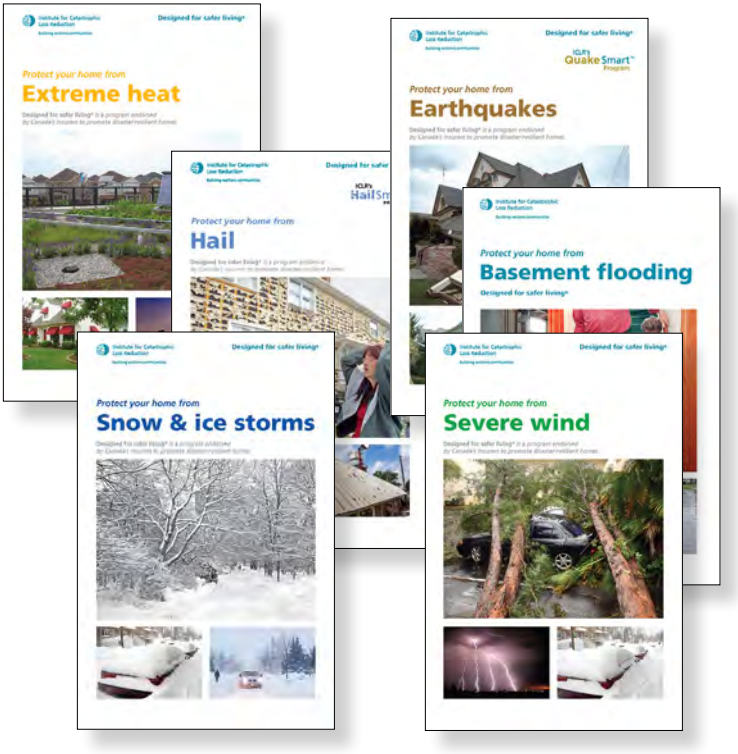

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