



ENHANCING COMMUNITY RESILIENCE AS WILDFIRE RISK INCREASES

SUMMARY

As climate change increases the risk of wildfires, individuals, communities, and governments will need to put more effort into protecting homes at the wildland-urban interface, where communities border on wilderness areas. Canada's FireSmart program is a well-recognized and effective tool to support informed local action and help build capacity and knowledge. Additional regulatory and financial tools are, however, also needed to reduce costs from property damage.



CLIMATE CHANGE INCREASES THE RISK OF WILDFIRE FOR COMMUNITIES

As climate change leads to increased temperatures and drier conditions, wildfires are likely to become more frequent, grow more intense, and last longer across many regions in Canada. Studies show that the number of dry, windy days that let fires start and spread could increase by as much as 50% in western Canada and 200% in eastern Canada (Climate Atlas, 2020). In fact, wildfire activity has already increased, with the average area burned in recent years double the size of what it was in the early 1970s (NRCan, 2016).



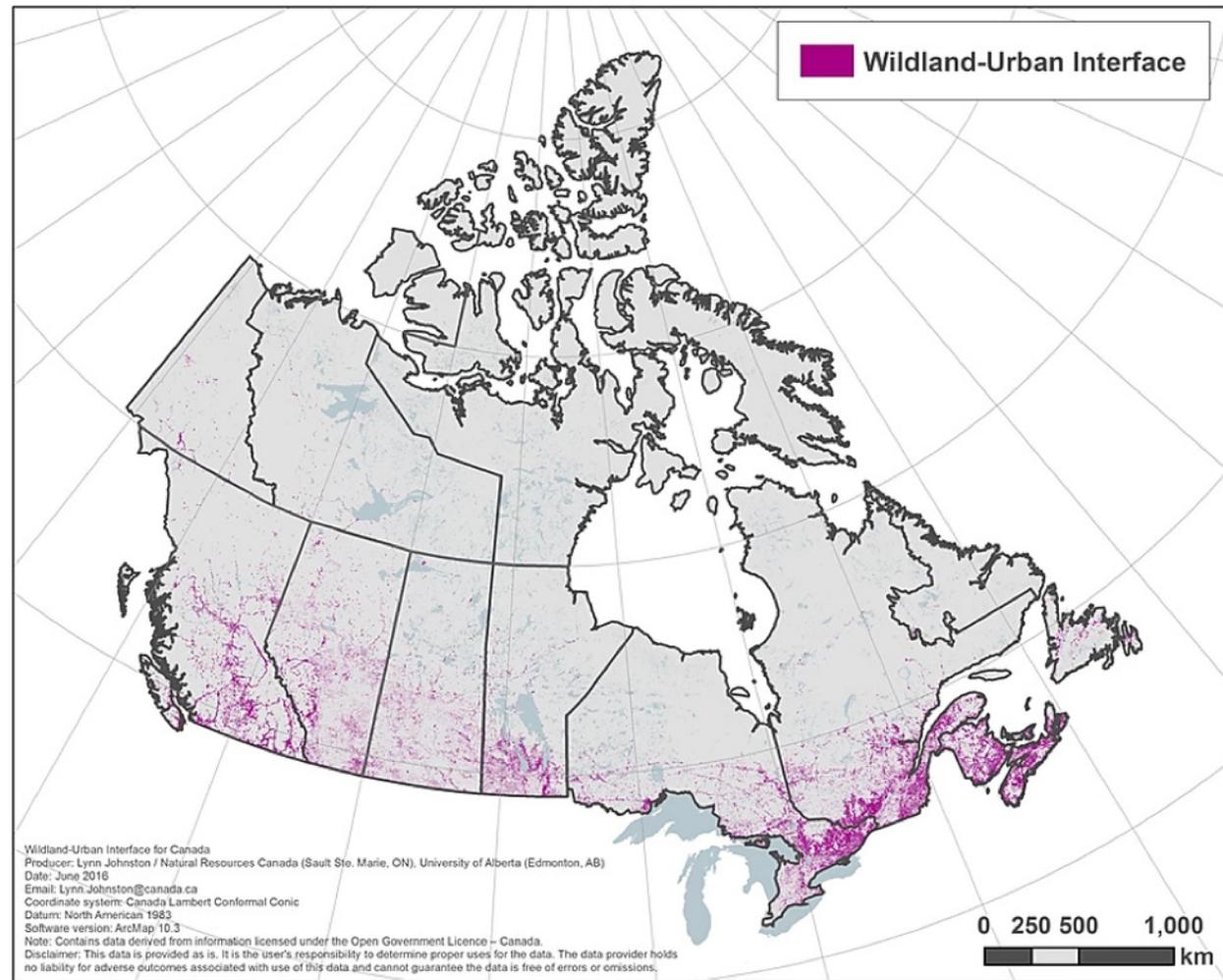


Wildfires can be devastating and costly for communities and individuals. Researchers estimate the 2016 Fort McMurray fire cost almost \$9 billion through physical, financial, health, mental, and environmental impacts (Snowdon, 2017). The fire destroyed more than 2,400 structures and displaced 85,000 people in the largest evacuation in Canadian history (Westhaver, 2017). One of the most compelling examples of the profound societal impact of the Fort McMurray fire was the staggering rise in mental health concerns such as depression and suicidal thoughts among grade 7-12 students eighteen months afterward (Brown et al. 2019).

Wildfire smoke can also affect the health of people far from the fire through reduced lung function, bronchitis, exacerbation of asthma, and increased risk of death. Air pollution from fires is a particular risk to pregnant women, children, the elderly, and those with pre-existing cardiovascular or respiratory conditions (BCCDC, 2020). Prolonged exposure to smoke from wildfires, as people in British Columbia and California experienced in 2018, increases the risk of immediate and future health problems. In addition, people living in wildfire-prone areas may experience exposure to smoke year after year.

An increase in the frequency and intensity of fires will mean that we see more of these large-scale traumatic events. As Figure 1 illustrates, Canada has an estimated 32.3 million hectares of wildland-urban interface, with 60% of all cities, towns, settlements, and remote communities facing interface fire risk (Canada Wildfire, 2018).

Figure 1:
Map of the
Wildland-Urban
Interface in Canada



Source: Canada Wildfire, 2018



HOW CAN COMMUNITIES REDUCE THEIR RISK?

After the Fort McMurray fire, people wondered why some homes survived and others did not. There were cases where the fire destroyed all homes in a neighbourhood except one. According to detailed assessments, most home ignitions were caused by embers from the forest fire, rather than direct contact with flames of the burning forest (Westhaver, 2017). So, the homes that survived must have either had features that protected them from embers, or the absence of common ignition hazards like leaves in gutters or a wooden deck.

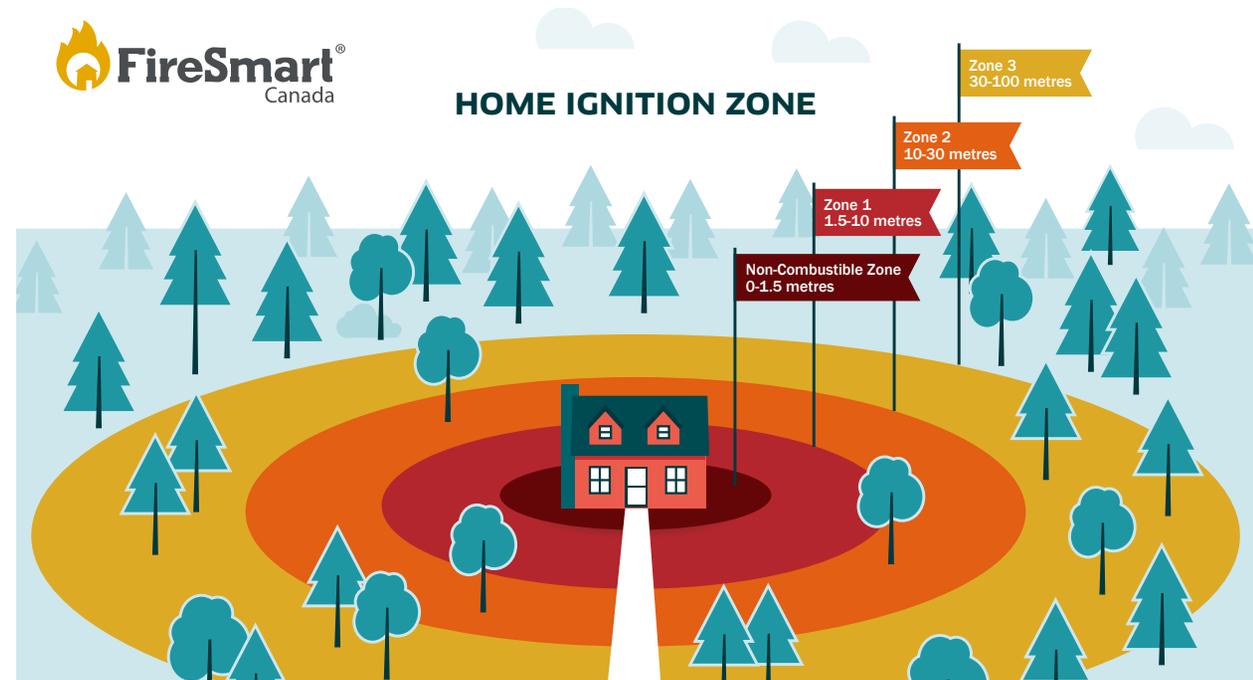
Comparing the characteristics of homes after the fire, experts found that surviving homes had low to moderate hazard level across 20 factors for ignition potential. Destroyed homes predominantly had high to extreme hazard level ratings. The review did not find any one critical hazard factor. Rather, a single weakness could result in a home's destruction (Westhaver, 2017). For instance, the ignition hazard could be a woodpile or shrubs next to the house, gutters with dried leaves, long grass, wood chips in the garden, wood siding, wood decks, or a roof with low fire resistance.

ALBERTA'S FIRESMART PROGRAM

One of the recommendations of the review of the Fort McMurray fire was to increase emphasis on reducing home vulnerability, through programs such as FireSmart. FireSmart, created by the Alberta-based multidisciplinary non-profit association Partners in Protection (PiP), helps communities and individuals take initiative to reduce their wildfire risk. It aims to build capacity and knowledge for people living in areas at risk of wildfire. Expanding from its roots in Alberta, FireSmart is now adopted in other provinces and at the national level (FireSmart Canada, 2018a). It receives funding from federal, provincial, and territorial governments, as well as insurance companies (ICLR, 2019).

FireSmart recommends removing ignition hazards, including wooden decks and siding, within 10 metres of the home (Figure 2). Over the longer term, homeowners that have enough financial resources can invest in more costly solutions such as more protective roofing materials (FireSmart Canada, 2019a; 2018a; 2018b). For more detail, see table on page 9.

Figure 2:
FireSmart Home
Ignition Zone



Source: FireSmart (2019b)



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To help homeowners make decisions to reduce fire risk, FireSmart uses trained firefighters to assess homes directly, pointing out simple preventative measures as well as longer-term investment options. They then return after a couple of years to assess progress. FireSmart Alberta has also developed a mobile app that allows homeowners to conduct self-assessment and identify key vulnerabilities on their own, with access to information resources and expert networks.

For example, some types of roofs are more fire resistant than others. Class A materials, such as asphalt shingles, fibreglass, clay or concrete tiles, and metal roofing (with the old roof removed) are the most fire resistant. Class C materials, such as cedar shakes, have a low fire resistance (FireSmart Lesser Slave Region, 2020). Clear information can make it easier for homeowners to demand fire resistant roofing materials and techniques.

The FireSmart program also encourages entire communities to adopt a plan, track progress, and make investments in risk reduction. As more properties within a community adopt FireSmart practices, the heat and speed of fire can be reduced for everyone (FireSmart, 2019b). The town of Canmore, Alberta, won FireSmart's Community Protection Achievement award in 2019. Its Wildfire Mitigation Strategy outlines FireSmart activities for the town and includes an updated hazard assessment, wildland fuel type and wildfire behaviour potential maps, and vegetation management options. It also makes recommendations for each of the seven FireSmart disciplines: vegetation management; development; public education; legislation; inter-agency cooperation; cross-training; and emergency planning (Canmore, 2020).

WHAT ELSE CAN BE DONE?



While FireSmart programs are a useful resource for homeowners, they place the burden of protection on individuals and communities—and not everyone is in a position to act. Homeowners may not be able to afford a new roof or siding. Lower-income, remote, and Indigenous communities may also have limited resources and competing priorities.

Strengthen Building Codes and Regulations

In 2016, a federal-provincial review found that most communities are not actively participating in FireSmart (CCFM, 2016). Experts have questioned whether there should be a greater role for provincial and federal governments in promoting fire resilience, given the broader public benefit of individual risk reduction efforts (Westhaver, 2017; Tymstra et al. 2019). Quebec is the only province that has regulatory standards that guide local governments in reducing wildfire risk (Tymstra et al. 2019). In most provinces and municipalities, building codes do not require builders to use fire resistant materials, which leaves homeowners shouldering the cost of renovation when seeking to reduce their risk. While new national codes are being developed to reflect climate change risk, it could be years before they trickle down to provincial codes (CP, 2020; ICLR, 2019). The National Fire Protection Association had proposed stricter building codes for wildland interface communities in 2011, but the idea was rejected at the time due to concerns about the burden of enforcement (CP, 2012). In the absence of building codes, FireSmart Canada, the Canadian Homebuilders Association, and the Intact Centre on Climate Adaptation are working to develop a FireSmart checklist for developers and homebuilders building in wildland-urban interface areas (Moudrak, 2020).

Undertake Meaningful Consultation

Research by Walker (2020) also highlights the importance of meaningful consultation when FireSmart programs are implemented, particularly when wildfire risk extends across multiple jurisdictions in a small geographical area. When the FireSmart program was implemented in the La Ronge region of Saskatchewan, for example, some Indigenous and non-Indigenous community members voiced concerns over



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how the local vegetation was being cut back in areas used for medicinal plant gathering and land-based education programs.

Limit Urban Sprawl

Many cities also continue to sprawl further into the wild, seeking inexpensive land for residential developments, increasing their risk and the overall cost of wildfires (McMahon, 2018). Few governments have been willing to limit development, and wildfire hazard maps that could help identify areas unsuitable for development are not yet commonly available (ICLR, 2019).

Invest in Risk Reduction

The response of governments to a changing fire regime in Canada has thus far been largely reactive, with financing focused on wildfire response and recovery. However, it is increasingly clear that investment in risk reduction is significantly more cost effective (IAWF, 2020). Further, the most effective wildfire risk management strategies involve a combination of home ignition reduction (through programs such as FireSmart) and forest management practices that reduce the likelihood and severity of wildfires (Calkin et al., 2014). In preparation for a fire-prone future, proactive, large-scale investment in these types of integrated strategies by federal, provincial, and local governments could dramatically reduce the impacts of wildfire on Canadians.

FIRESMART ADVICE FOR HOMEOWNERS IN WILDFIRE-PRONE AREAS

HOUSE 0-1.5 metres from home	YARD	
	1.5-10 metres from home	10-30 metres from home
<ul style="list-style-type: none"> • Roof: Use class A fire-rated roof assembly (metal, asphalt, clay, and composite rubber tiles). Regularly clean the roof of combustible materials. • Chimney: Use a spark arrestor to reduce the chance of sparks and embers escaping. • Gutters: Regularly remove debris and consider screening gutters. • Eaves and Vents: Install non-combustible materials for all vents (3 millimetre screening or ASTM fire rated vents). Properly fitted soffits and fascia help to reduce the risk of embers and heat reaching the wooden rafters of your home. • Siding: Stucco, metal siding, brick/concrete, and fibre cement siding offer superior fire resistance. • Windows: Use tempered, thermal (double paned) windows. • Doors: All entry and garage doors should be fire rated and have a good seal. • Ground to Siding Clearance: Leave at least 15 centimetres of clearance. • Decks: Enclose areas under decks and balconies and sheath in the base with fire resistant materials. • Attachments: Separate houses from wooden fences with a metal gate, cut grass along the fence line, and ensure sheds and outbuildings are FireSmart. • Landscaping: Maintain a non-combustible zone 1.5 metres around home. 	<ul style="list-style-type: none"> • Landscaping: Plant a low density of fire-resistant plants and shrubs. Avoid having woody debris, including mulch. Select fire-resistant plants. • Grass: Grass shorter than 10 centimetres in height is less likely to burn intensely. • Firewood piles: Keep firewood piles away from home. • Burn barrels and fire pits: Keep the area within 3 metres free of combustible material and place as far away as possible from structures and trees. Screen burn barrels with fine mesh. Fire permits are required in many jurisdictions. • On-site fire tools: Have readily accessible shovels, rakes, axes, garden hoses, sprinklers, and ladders. • Power lines: Contact a local utility company to clear branches and other vegetation away from power lines. • Trees: Deciduous trees are resistant to wildfire (Poplar, Birch, Aspen, Cottonwood, Maples, Alders, Ash, Cherry). Avoid Cedar, Pine, Fir, and Spruce. • Maintenance: Clean up debris including dry leaves, twigs, and branches, and combustible shrubs, each spring. 	<ul style="list-style-type: none"> • Tree spacing: Keep a minimum of 3 metres between the outermost branches of trees. • Tree pruning: Remove branches within 2 metres of the ground on ever-green trees.

For more information visit <https://firesmartcanada.ca/homeowners/>

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