

Yellowknife, a FireSmart city

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Report based on the
principles of



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Summary

The City of Yellowknife is likely to experience wildfire events in the future and should act to reduce the risk of fires spreading to structures in the city, impacting people's lives, homes and communities. In this report, I explore the opportunity of implementing more FireSmart initiatives in Yellowknife. FireSmart is a national program that is implemented on the scale of a community or a neighbourhood. It aims to reduce wildfire risk and improve fire mitigation responses by coordinating residents, fire agencies and local policy makers. The City of Yellowknife should focus on Education, Emergency Planning and Vegetation Management as those are the elements of FireSmart that empower Yellowknife residents to take ownership of fire prevention. The City should aim to have multiple neighbourhoods be recognized as "FireSmart neighbourhoods" by the program, meaning that its residents are actively taking part in FireSmart. The City should also employ FireSmart concepts outside of residential areas, in particular around the existing firebreaks that were created in 2023. By empowering residents to take action on FireSmart initiatives, the City of Yellowknife could be in a good position to respond swiftly to future wildfire events. The City of Yellowknife also has the opportunity to be a leader in community-led FireSmart initiatives by empowering residents who are not landowners to also take ownership of wildfire safety, ensuring that all of Yellowknife is a stakeholder in its future safety.

Fuel Mitigation as a tool to reduce fire risk

Wildfires are a natural, and essential, disturbance in Canada's Boreal Forest (Bergeron et al., 2002). However, because of climate change bringing drought and the legacy of colonial fire management (ban of traditional prescribed burning, systematic fire extinction) having led to accumulated fuel across the country, wildfires are more intense than ever (Flannigan et al., 2009). This new intensity is threatening infrastructure and entire communities throughout the country.

Fuel treatment is a proven tool in reducing fire risk and fire intensity (Beverly et al., 2020). Fuel treatment can take many forms, including fuel removal (e.g. the firebreaks developed around Yellowknife in 2023 or removing highly flammable plants that are next to homes), fuel reduction (e.g. removing dead branches and trimming trees in forests, mowing lawns) and vegetation alteration (e.g. replacing flammable coniferous trees near communities with deciduous trees, planting fire-resistant plants in home gardens).

However, fuel treatment efforts can be unpopular in communities, especially those in more rural settings (Mockrin et al., 2018). Social acceptance of wildfire mitigation through fuel management is consistently associated with greater perceptions of wildfire risk (McCaffrey et al., 2012). But experiencing a natural hazard (such as Yellowknife residents experiencing the evacuation in 2023) has an inconsistent effect on risk perception (McCaffrey, 2004). However, quickly following a wildfire, there may be a "window of opportunity" for adaptation, in which social acceptance of fuel management is at its highest (Mockrin et al., 2018). Furthermore, this social acceptance of fuel management reduces with time since the hazard exposure (Mockrin et al., 2018). This indicates that if the City of Yellowknife wants to make meaningful changes to its fire mitigation strategy, it should do so now.

As part of our interviews when in Yellowknife, we heard that there is a heightened anxiety about wildfires among residents since the evacuations. We've also heard that residents want to know what is being done by the government to increase safety, and that they don't feel empowered to take ownership of prevention initiatives. At the same time, both municipal and territorial government have stressed that residents must be at the source of any wildfire prevention, and that most resources and funds are allocated to wildfire response, rather than prevention. Therefore, the City of Yellowknife needs a set of policies, programs and/or initiatives that reduces fire risk, while empowering residents to take ownership of the problem, and without being a burden on city resources.

An overview of the FireSmart program

In order to improve safety, it is very important to learn to live with the fires. A national program whose aim is to reduce the risk associated with wildfires is FireSmart Canada.

The FireSmart Program is composed of seven “disciplines”: Education, Emergency Planning, Vegetation Management, Legislation, Development, Interagency Cooperation and Cross Training. The Legislation discipline involves having municipal building standards that ensure planning and development adheres to FireSmart principles. The Development discipline aims to make materials used in buildings less flammable. Interagency Cooperation relies on proactively establishing relationships between stakeholders of risk mitigation and response. The Cross Training discipline involves bringing emergency response organizations together to identify any gaps in their response and weaknesses in their collaboration (FireSmart Canada, n.d.-b).

Education, Emergency Planning and Vegetation Management are the disciplines within FireSmart that require the most community involvement. In the case of Yellowknife, the remaining four disciplines are usually in the scope of municipal, territorial or federal governments. While those four disciplines are also important in reducing fire risk, this report and recommendations will focus on the first three.

The Education discipline starts with a resident or a group of residents learning about the threat of wildfire and how to mitigate it. It relies on empowered community members to share FireSmart Canada education resources within their community.

The Emergency Planning discipline requires residents and communities to make an action plan in preparation for an eventual wildfire event. The purpose of these plans is for

residents to be prepared to respond before, during and after a wildfire. This can look like making an emergency kit or making a checklist of actions to take right before evacuation. For example, this checklist might include removing any propane tanks from the vicinity of the house or leaving a gate open to allow fire suppression teams to enter the property more easily.

The Vegetation Management discipline is the most labour-intensive of the three, but also empowers community members to directly reduce fire risk for their house and their neighbours. This discipline involves community projects to remove, reduce or convert flammable vegetation. It can be done on the scale of a single property or throughout an entire neighbourhood. Involving community members in the decision making related to vegetation management is crucial, because it empowers residents and makes public acceptance of these initiatives much more likely (McCaffrey et al., 2012).

The FireSmart program relies on community members to start a grassroots operation at the scale of a neighbourhood and emphasises empowering non-professionals to learn about fire risk and do fuel management near physical structures. This grassroots approach has three main benefits, if successful: first, it increases the geographic scale at which fuel management can be done by not relying exclusively on the limited number of fuel management experts. Second, by moving decision-making from external experts to community members, it ensures that fuel management is appropriate for the local context, and that the community understands and accepts what is done. Third, by empowering communities to learn about and do fuel management themselves, this program ensures that communities are safe for a longer time.

Removing forest fuels is a demonstrated way to reduce fire risk (Beverly et al., 2020), but the value of the small-scale approach of FireSmart is also that it allows for easier fire suppression: by removing fuel buildup around a community, fire suppression infrastructure is much easier to set up (Kelly, 2021).

Case studies

FireSmart-like initiatives have been undertaken throughout North America, with varying degree of success. This report will explore three very different case studies to explore what has been done elsewhere. The first case study will be the hamlet of Enterprise, NWT. This community is noteworthy because it was the first recognized FireSmart community in the Territories, and that it also experienced a major wildfire exposure in 2023. The second case study, Logan Lake, BC, is often considered the major success story of the FireSmart program, because of the early adoption of wildfire risk mitigation, and the innovation done by the community to ensure they could lower risk. The last case study is Marin County, California. The county's population make it an interesting exploration of what wildfire mitigation looks like with many stakeholders and resources. While none of these three locations are comparable to Yellowknife in both scale and geographical particularities, they can inform what the municipality of Yellowknife could undertake.

Enterprise, NWT

Population of around 100 (Statistics Canada, 2017)

In 2018, the hamlet of Enterprise was the first officially recognized FireSmart community in NWT (GNWT, 2018). That year, volunteers from the community engaged in fuel cleanup to remove hazardous fuels in the community boundaries.

Speaking to Cabin Radio, Blair Porter (senior administrative officer of Enterprise and Fire chief in 2018) said that there was fluctuation in the efforts to progress the hamlet's FireSmart plan (Rosenfield, 2023). In 2023, however, a wildfire risk assessment deemed Enterprise to be vulnerable to wildfire. In response, the hamlet built fire breaks and ordered fire suppression equipment (Rosenfield, 2023). Unfortunately, on the 13th of August 2023, a wildfire destroyed nearly 90 per cent of the community (Maclean, 2023). Still, Blair Porter credits the FireSmart initiatives for having saved the southern part of Enterprise (Rosenfield, 2023). In reflecting on FireSmart fuel mitigation around homes, Blair Porter also stressed the importance of a complete adoption of the practices, giving the example of a property that had done fuel mitigation work on the house and in the yard, but had a juniper tree right beside a window. "The juniper tree would catch on fire. And all the work that had been done on the house, in the yard, really didn't matter, because that one caught on fire – and then that melted the vinyl window, and then got into the structure and burnt the house down" (Rosenfield, 2023)

Logan Lake, BC

Population of around 1350 (Statistics Canada, 2023)

Logan Lake has been a recognized FireSmart community since 2013 (Forest Enhancement Society of BC, 2022). Logan Lake has set up innovative programs as part of their FireSmart plan:

- A summer student program, where students are hired during the summer to do fuel management in the crown land surrounding Logan Lake. The program is funded by the Canada Jobs Grant and the students are mentored by a First Nation enterprise, the Lower Nicola Indian Band Development Corporation (Logan Lake, n.d.).
- A roof sprinkler program, through which homeowners can purchase a roof sprinkler at the cost of 47\$ and have it installed for free by the fire department. During the installation, a FireSmart assessment is conducted, and its resulting recommendations are shared with the homeowner. The roof sprinklers are only activated by the fire department if a fire is threatening the area. (Kovacs et al., 2020).
- The purchase of forested lands around the town through a community-owned corporation, ensuring that the municipality had the power to do fuel management in high-risk areas (Mierau, 2015).

In August 2021, the entire town was evacuated because of the Tremont Creek Wildfire. The fire got very close to the town, but no structures were lost. The town's Fire Chief credited the FireSmart program for having limited the fuel in the surrounding area, and having made the fire management work much easier – sprinkler installation was achieved in just over 24 hours, instead of the three to four days it would have taken otherwise (Kelly, 2021).

Marin County, California, USA

Population of around 250 000 (U.S. Census Bureau, 2023)

Marin County has a long history of wildfire exposure. Thousands of acres burned during the 20th century, destroying hundreds of homes (County of Marin, n.d.). Through the Firewise program (USA equivalent of FireSmart), over 80 communities are recognized for their fuel management efforts, encompassing 50 000 homes (Fire Safe Marin, 2021).

Through Fire Safe Marin, a non-profit organization and the official outreach arm of the Marin Wildfire Prevention Authority, Marin County residents have access to many programs and resources.

For example, an annual “wildfire prevention festival”, whose infographic promises “Family fun, goats, food, music, wildfire safety” (Fire Safe Marin, 2024).



Figure 1. Ember stomp festival infographic. (Fire Safe Marin, 2024)

In addition to events, residents also have access to a variety of resources: from landscaping resources such as which local plants should be included in homeowner's gardens (Fire Safe Marin, 2019) to wildfire safety tips for renters, which includes information such as the responsibility of the landlord in maintaining the safety of the unit (Fire Safe Marin, 2023).

In fact, Marin County's fire safety communication efforts are unique in North America in that they have messaging dedicated to residents who aren't landowners.

Lessons for Yellowknife

As noted above, neither of these three areas can be compared to Yellowknife, but they provide lessons for the municipality. From Enterprise, that FireSmart can be done in NWT and be supported by the territorial government. It also shows that a FireSmart program is successful when it is done thoroughly throughout the community and that it does not remove all fire risk. Logan Lake's population is closer to that of a territorial riding within Yellowknife, and as such can be used as an inspiration for initiatives to do at that scale. The town's roof sprinkler program is particularly interesting for its ability to incentivise homeowners to act on FireSmart principles on their property. Finally, the resources Marin County shares with its residents, along with the community events could be replicated at the scale of Yellowknife. The County's inclusion of residents who aren't landowners in their messaging is a striking difference from most other wildfire risk reduction initiative in North America. The City of Yellowknife should ensure that any similar initiative also include all residents, not just those who own their property.

FireSmart implementations for Yellowknife

The City of Yellowknife has the opportunity to be a Canadian leader in community-led fuel management and should aim to have multiple FireSmart recognized neighbourhoods. In particular, neighbourhoods that are the most likely to be in the path of a wildfire should be identified, and any city outreach regarding FireSmart should be concentrated on residents of those neighbourhoods.

The federal FireSmart Canada program distributes some funds to provinces and territories. As such, the city might find funding and other support from the territorial government. City staff should consider using Yellowknife's legislative ridings as the target neighbourhoods. This strategy would enable the city to focus their outreach on smaller parts of the city, and could also help with territorial government relations by working directly with that riding's elected Member of the Northwest Territories Legislative Assembly. Four ridings that could be considered for priority outreach are Yellowknife North, Range Lake, Yellowknife South and Kam Lake. These ridings are on the edge of the city and are therefore likely to contain the most strategic areas for fuel management,

As part of its emergency preparedness outreach, city staff should actively share FireSmart resources. Likewise, any resident approaching the city inquiring about wildfire prevention and safety should be directed to any existing FireSmart initiatives or encouraged to start their own.

Residents should be encouraged and empowered to host FireSmart events in their neighbourhoods. City staff could support these events by connecting those residents with the territorial government, who has money available to help fund such events. GNWT and the Canadian Interagency Forest Fire Centre have funded 13 "Wildfire Community

Preparation Day” projects across the territories this year (GNWT, 2024). Furthermore, the department of public safety could be a great asset by sending Yellowknife Fire Division staff to these events and help educate the public on wildfire prevention and safety. Finally, the city could provide support in advertising any community events.

Neither the city nor interested residents would need to develop their own educational material, as FireSmart Canada hosts many resources and trainings on their website.

The Fire division is already working in conjunction with FireSmart Canada and FireSmart NWT to bring “Home and Property Assessments” for local homeowners, business owners and property management companies in Yellowknife and Ndilo (City of Yellowknife, 2024). These assessments are meant to provide recommendations to reduce fire risk around structures. This program could be augmented by including a rooftop sprinkler program like the one in Logan Lake. Including a sprinkler program would help incentivise homeowners to get the FireSmart assessment, and it could also be a cost-effective way to protect homes in the event of a wildfire. As is the case in Logan Lake, the fire department would likely need to store the hoses to ensure that the sprinklers are only used appropriately, such as an approaching fire.

The City of Yellowknife is already doing outreach to residents about emergency planning, including through ads on Cabin Radio. City staff should take advantage of the efforts already being done in this outreach to include more FireSmart resources, and connect with residents to encourage them to lead FireSmart initiatives.

Vegetation management is one of the crucial aspects of FireSmart that will help fire suppression efforts in the event of wildfire. Residents should be encouraged to take action based on the FireSmart assessments they receive.

Community-led vegetation management, where neighbours get together to reduce risk around the neighbourhood is a great avenue to include non-landowners, such as tenants. Residents of Yellowknife who are tenants and any identified community leaders should be encouraged to participate and/or lead these vegetation management efforts. Property owners should take advantage of these opportunities to reduce the risk on their property. The City of Yellowknife could encourage these events by offering free disposal of any vegetation waste and help interested residents in organising these events.

The City of Yellowknife should also organise vegetation management initiatives, in particular to maintain the firebreaks that were created in 2023. The firebreaks are a great addition to the wildfire defences of the city, and the City should ensure that there is minimal re-growth of flammable vegetation, so that it can be an existing asset when responding to future wildfire emergencies. To do this, the City of Yellowknife could implement a youth employment program similar to the one in Logan Lake.

The most important part of FireSmart is to empower residents to take action and initiative. The city could achieve this best by identifying community leaders and empowering those individuals to lead their community in learning about and action on FireSmart. The city should encourage those community leaders and any other resident showing interest to take the FireSmart101 training, which is a free, online, one hour long training introducing FireSmart and its principles (FireSmart Canada, n.d.-a). City staff should also be encouraged to take this training and could be given some compensation for completing it.

Collaboration with Yellowknives Dene First Nation

A successful FireSmart implementation should include collaboration with YKDFN. For example, indigenous knowledge holders should be invited to any city-led community fuel management events.

The City of Yellowknife could also provide support to YKDFN communities in applying for federal funding through the Emergency Management FireSmart program, which specifically provides funding to First Nation communities to support wildfire mitigation and preparedness initiatives (Government of Canada, 2022).

FireSmart, a communication challenge

In the event of a successful FireSmart implementation in Yellowknife, one challenge will be to ensure that the public understands what FireSmart does and does not do. It should be emphasized that FireSmart reduces fire risk and helps fire suppression efforts. However, FireSmart does not remove wildfire risk entirely.

Conclusion

In conclusion, the City of Yellowknife has the opportunity to proactively address wildfire prevention by enhancing its FireSmart initiatives. The City of Yellowknife can take advantage of the fact that social acceptance of fuel mitigation is likely to be at its highest, following the 2023 Wildfire evacuations. This report has highlighted the importance of adopting FireSmart strategies, which involve community-wide efforts to mitigate wildfire risks through education, emergency planning, and vegetation management. By encouraging neighbourhoods to take FireSmart initiatives, the City of Yellowknife can empower residents to take ownership of fire prevention and maintain long-term safety plans. Extending FireSmart principles beyond residential areas, particularly around the firebreaks established in 2023, will further strengthen the city's wildfire resilience. Through these efforts, Yellowknife can position itself as a leader in community-led FireSmart initiatives at a national scale, ensuring comprehensive involvement in wildfire safety and securing a safer future for all its residents.

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