Modernizing Ontario's Wildland Fire Management

Discussion Paper

Introduction

With large and challenging wildland fire events in recent years, and continued rapid changes to our environment and society, the government of Ontario is taking steps to modernize wildland fire management. Wildland fire emergencies can threaten people and communities and contribute to significant social and economic disruption, and the potential for increased requests for emergency response and assistance can strain response efforts. Among other changes and challenges influencing wildland fire risk, Ontario is expected to face milder winters and a significant rise in the number of extreme heat days per year which leads to drier and more extreme fire conditions and may contribute to longer and more challenging fire seasons.

The Ontario Ministry of Natural Resources (MNR) is assigned responsibility for seven types of emergencies under the *Emergency Management and Civil Protection Act* and by Order-in-Council 1739/2022. These are 1) forest fires, 2) floods, 3) drought/low water, 4) dam failure, 5) crude oil and natural gas exploration and production, natural gas and hydrocarbon underground storage and salt solution mining emergencies, 6) erosion, and 7) soil and bedrock instability. Ontario's legislative authority for wildland fire management (forest fires) is outlined in the *Forest Fires Prevention Act* (the Act) which sets out prevention, response, and compliance measures.

The Act and its regulations also provide the MNR Minister with the authority to declare a restricted fire zone or a forest fire emergency area and order any actions or restrictions that are necessary for fire suppression and to protect or evacuate people from the area.

Ontario

MNR's responsibilities include **wildland fire management** on provincial public (Crown) land, and leading the prevention and mitigation of, preparedness for, and response to wildland fires across Ontario's fire region. MNR delivers frontline operations for wildland fire management and provides support to municipalities, unincorporated communities, First Nation communities, Emergency Management Ontario and to other ministries with emergency management responsibilities in Ontario.

Ontario recognizes that wildland fires are an important natural disturbance in Ontario's forests and grasslands, and that wildland fires can provide long term ecological benefits. Fire renews the forest, creates healthy natural habitats, and supports ecologically diverse landscapes.

In **2021** the province experienced a severe wildland fire season that resulted in approximately:

793,000
hectares of forests burned

= 1.5 Million
football fields

Projections suggest that Ontario may see an increase in the size, number and complexity of wildland fires in the coming years and decades. Ontario is already seeing years where the wildland fire season is lasting longer into the fall, and where wildland fire events are resulting in larger areas burned than in the past[1]. For example, in 2021 the province experienced a severe wildland fire season that resulted in approximately 793,000 hectares of forests burned, amounting in size to nearly 1.5 million football fields. Research suggests that over the next several decades Ontario's fire season will lengthen by more than 20 days[2]. By 2040, Ontario is expected to experience an increase of nearly 50 percent in the wildland fire occurrences compared to numbers recorded prior to 1990[3], and the average area burned in Ontario will increase significantly, potentially doubling by 2050[4]. By the 2070s, the annual area burned across northern Ontario is projected to see up to a four-fold increase[5]. Enhancing existing program response capacity alone cannot match these increases in wildland fire activity, necessitating the review and ongoing development of a modern approach to wildland fire management in Ontario.

Wildland fire emergencies can disproportionately affect Indigenous peoples compared to other residents of Ontario. Many First Nation communities in Ontario are situated in remote areas of the province and they are frequently impacted by smoke and wildland fires. First Nation communities can face greater risk of evacuation, and threats to their communities and to the lands that Indigenous peoples depend on for food, medicines, ceremony, and other uses.

Wildland fires are increasing in other places. In 2023, Canada experienced an unprecedented wildland fire season that started early and was marked by extreme fire behaviour at times. A record-setting 18 million hectares burned, more than seven times the national average. In recent years, western provinces (e.g., British Columbia) and states (e.g., California) have experienced mild winters and dry conditions that contributed to severe and prolonged wildfire activity. In response, these jurisdictions have increased focus on wildland fire science, recruited additional front-line staff, and developed action plans and strategies that seek to reduce wildland fire risk, restore fire-adapted landscapes, and protect public safety.

Ontario's Fire Region

The *Forest Fires Prevention Act* applies only to the fire region, which is comprised of the northeast, northwest and central regions of Ontario. Most of southern Ontario is not in the fire region.

Indigenous Peoples

Fire is central to many aspects of Indigenous life with the understanding that it is natural and beneficial, promotes ecological diversity, and is a form of medicine for Indigenous people and the land. Cultural burning practices have long been an important aspect of Indigenous peoples relationship with the land.

Proposed new vision for wildland fire management

Our wildland fire management Vision:

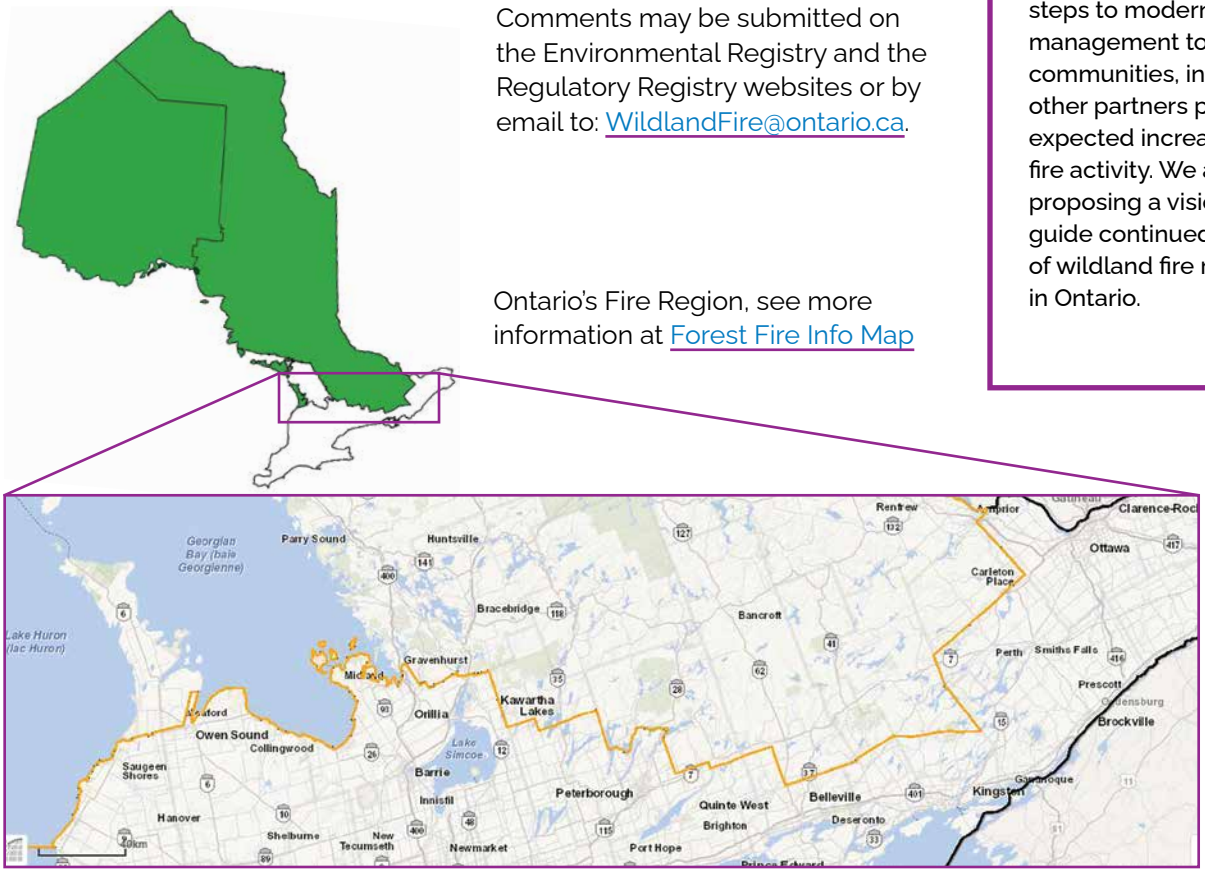
An Ontario that **works together**, through all sectors, to **reduce the risks and minimize the unwanted impacts of wildland fires**, creating **safer** and **more resilient communities**.

With this new wildland fire management vision, we are aiming to create a modernized approach to wildland fire management in Ontario that would:

1. Strengthen collective responsibility for wildland fire management
2. Improve awareness of wildland fire risk
3. Expand prevention and mitigation of wildland fire
4. Enhance preparedness and response to wildland fire
5. Strengthen rules and consequences for non-compliance with forest fire laws

To achieve these five objectives, the Ontario government has initiated a wildland fire program and policy review and is considering changes to the *Forest Fires Prevention Act*. The proposed program and policy enhancements and the potential changes to the *Forest Fires Prevention Act* are organized under each of the five objectives in the next section of the discussion paper. To help with gathering feedback, there are discussion questions for each objective.

Your feedback will be considered and help to inform any decisions about the final vision and the development of proposed changes to the *Forest Fires Prevention Act*. Comments may be submitted on the Environmental Registry and the Regulatory Registry websites or by email to: WildlandFire@ontario.ca.



Ontario's Fire Region, see more information at Forest Fire Info Map

Seeking your input to support modernizing Ontario's wildland fire management

With large and challenging wildland fire events in recent years, and continued rapid changes to our environment and society, Ontario is taking steps to modernize wildland fire management to help people, communities, industry and other partners prepare for an expected increase in wildland fire activity. We are starting by proposing a vision statement to guide continued modernization of wildland fire management in Ontario.

Objectives for a modern approach to wildland fire management

1. Strengthen Collective Responsibility for Wildland Fire Management

Wildland fire management in Ontario is a shared responsibility. The Ontario government recognizes the importance of strengthening collective responsibility for wildland fire management, with an emphasis on moving towards a collective, whole-of-society approach. A whole-of-society approach recognizes that everyone has a role to play in reducing wildland fire risk and that governments alone cannot build wildland fire resiliency. While there are communities in Ontario that have taken steps to plan and prepare for wildland fires, overall the approach varies across the fire region. With wildland fire activity and impact expected to increase, acting with urgency and collective responsibility for wildland fire management is important to reduce the exposure of people and communities to wildland fire risk.

By strengthening collective responsibility, and with strong and active involvement from Indigenous communities and partners in wildland fire management, the province will become more resilient. That's why MNR continues to advance partnership and relationship building with Indigenous communities, including striving to better integrate Indigenous knowledge and cultural burning practices into wildland fire management. Indigenous experiences and traditions are valuable and important for risk reduction.

To help bring the diversity of voices, organizations, and communities together to strengthen collective responsibility for wildland fire management, MNR is exploring approaches and models (e.g., a wildland fire advisory committee) that could provide leadership and support for information-sharing and action among Indigenous peoples, communities, industry, volunteers, and various levels of government.

Potential changes to the *Forest Fires Prevention Act* under consideration are:

- **Enable the Minister to enter into agreements (e.g., with municipalities, First Nations) on all aspects of wildland fire management. Currently, the ability to enter into agreements is focused on the "prevention, control or extinguishment of grass, brush or forest fires". Broadening the scope for these agreements would allow and support partnerships and collaborations that can be more responsive to changing wildland fire risks.**

Discussion Questions

1. Do you support strengthening *collective responsibility* for wildland fire management in Ontario? What steps can be taken to immediately strengthen collective responsibility for wildland fire management?
2. Do you have suggestions for an approach or model that would support advancing the collective responsibility for wildland fire management?

2. Improve Ontario's awareness of wildland fire risk

There are many ways to define and assess wildland fire hazard and risk; each at different landscape scales (e.g., regional, community, neighbourhood, site), timescales, or even by using slightly different definitions and processes. This can lead to inconsistency, confusion and uncertainty about whether, and to what extent, a hazard or risk exists, and equally important, what specifically to do about it. Generally, there are two main opportunities to better apply risk information. First, the assessment, communication and use of fire hazard/threat information to guide short-term preparedness and response actions. And, secondly, the long-term proactive assessment, communication and use of wildland fire risk to guide appropriate risk reduction efforts (e.g., fire prevention and mitigation activities).

During high wildland fire hazard, where the likelihood of fires starting and becoming more impactful is escalated (e.g., periods of very dry conditions, fire emergencies), people and communities need the best information possible to guide their decision-making and action. During the wildland fire season, MNR provides fire hazard or risk information through a variety of sources:

- The Interactive Fire Map identifies real time fire danger assessments.
- Provincial, regional and local level communications to partners, Indigenous communities, and the media (e.g., Ontario.ca, social media, media interviews, partner briefings, situational awareness documentation).
- Daily fire indices distributed to help industries working within forest areas of Ontario to assess and determine whether operational changes and mitigations are required to reduce wildland fire risk on or near their industrial worksites.

Prompt action is imperative during emergency situations. That's why MNR is exploring how real-time hazard and other information can be better communicated and integrated into the decision-making of fire managers, partners, industry, communities, and the public. As part of enhancing emergency communications, MNR is considering improvements to applied science and predictive service capabilities that will support continuous improvement, innovation and better decision making during escalated fire situations.

In addition, MNR is exploring how improvements to the assessment, communication and use of focused wildland fire risk information can better enable proactive (pre-event) and comprehensive risk reduction actions. Consistent, standardized, evidence-based approaches to assessing wildland fire risk can help communities, industries and individuals better assess and understand an evolving and changing wildland fire risk and ultimately take the appropriate actions. For example, MNR is investigating:

- The development of wildland fire risk assessment and information products to inform actionable planning decisions made by communities, industry, and the public.

Discussion Questions

3. What types of information and tools would help individuals and communities with identifying and understanding wildland fire risk?

4. Industrial activity can cause wildland fires. Many types of industrial activities are already subject to various fire prevention rules and regulations. Do you have suggestions about how to improve the approach to preventing and preparing for wildland fires caused by industrial activity?

- The methods by which risk assessments and wildland fire risk information are communicated, such as with focused campaigns to build a better understanding of wildland fire risk and what may be done to reduce the risk (at homeowner, site, community and broader scales). Wildland fire awareness campaigns may also promote greater understanding of the ecological role of wildland fire and understanding of wildland fire management roles and responsibilities.
- The integration of wildland fire risk information into enhanced wildland fire preparedness, planning, prevention and mitigation initiatives such as evacuation or emergency planning, open-air burning restrictions, staff training, land-use planning, and vegetation management practices.

3. Expand prevention and mitigation of wildland fire

Catastrophic wildland fire emergencies that have occurred in recent years in Canada – such as the 2016 Horse River wildland fire that burned large parts of Fort McMurray, Alberta and the 2021 wildland fire that destroyed the town of Lytton, B.C. – are vivid examples of the potential dangers that wildland fires can create for people and communities. With the number of wildland fires expected to increase in Ontario in the coming decades, and the potential that wildland fire emergencies become more challenging to respond to, localized efforts to pro-actively implement wildland fire risk reduction activities are increasingly needed to help keep people and communities safe. Pro-active risk-reduction activities include taking steps to prevent unwanted fires and to mitigate the negative impacts associated with them. Proactive risk reduction activities significantly reduce fire-related losses and can provide a high return on investment. Municipalities, industry and other organizations all have an important role to play in providing local leadership and taking action to expand prevention and mitigation of wildland fire.

Wildland fire prevention initiatives and programs have been in place for many years. Specific prevention measures are required under the *Forest Fires Prevention Act* and its regulations. For example, the *Forest Fires Prevention Act* sets out that some facilities that are within 300 metres of a forest area must be cleared of flammable debris.

Mitigation programs and activities that are targeted at reducing the negative impacts of wildland fire are a more modern concept in wildland fire management. Additional prevention and mitigation actions are described in MNR's Wildland Fire Management Strategy, 2014, including the analysis of trends in wildland fire causes to direct prevention activities, and promoting mitigation strategies, tactics and initiatives, such as FireSmart™ (a national program that focuses on helping to increase neighbourhood resilience to wildland fire and minimize its negative impacts).

Discussion Questions

5. What resources and support are necessary for municipalities and industry to enhance wildland fire management planning that comprehensively addresses wildland fire risks?
6. How can we foster collaboration among individuals, municipalities, industry, Indigenous communities, and other emergency partners to build capacity, invest in, and take proactive measures for wildland fire prevention and mitigation?
7. What innovative approaches can we explore to collectively fund prevention and mitigation activities?

Building on initiatives to improve awareness of wildland fire risk, MNR is initiating efforts to update and enhance the effectiveness and consistent use of wildland fire prevention and mitigation activities, programs and policies. Specific enhancements that are being explored include:

- Improvements to open-air burning, or fire prevention, policies.
- Enhancements to fire prevention and mitigation program implementation supports (for example training, communications campaigns, advisory services, financial incentives and/or support programs) to help guide communities, industry, Indigenous communities, and partners in their ability to implement effective risk reduction plans and programs.
- Enhanced use of vegetation and fuel management (i.e. forest debris) efforts to proactively reduce wildland fire risk. This may include building upon and encouraging timber harvesting opportunities, thinning of hazardous forests, integrating fire risk reduction considerations into forest management planning and silviculture practices, as well as prescribed burning and the beneficial use of fire to reduce risks.
- Enhanced integration of land-use planning (or development) practices and wildland fire risk reduction to promote the consideration of wildland fire risk and the integration of mitigation tools.

Potential changes to the *Forest Fires Prevention Act* under consideration are:

- **Update and improve standards for wildland fire management planning and grant the authority to the Minister to require the development of, or revisions to these plans. This authority may be applied where a municipality or industry in the fire region does not have a plan, or where an existing plan does not adequately address wildland fire risk.**
- **Expand the Minister's ability to issue orders to address wildland fire management risks and actions more broadly. For example, an order could be made requiring specific prevention or mitigation activities.**

Did you know?

While it can vary from year to year, approximately 50 per cent of wildland fires MNR responds to are caused by people and the activities we engage in. Natural causes, primarily lightning, ignite the remaining 50 per cent of all wildland fires.

Over the past 50 years, the risk of lightning-caused fires has trended three weeks later into October[6].

Wildland Fire

Any fire burning in forested areas, grass, or alpine/tundra vegetation. The term forest fire is synonymous with wildland fire.

Wildland Fire Management

Includes preventing, mitigating, preparing for, detecting and responding to wildland fires, and protecting people and communities, property, timber supply and infrastructure. In addition, wildland fire management involves using wildland fires and prescribed burns to meet objectives such as risk reduction, the natural regeneration of plants and forests, and resource management (the science-based management of land, water, soil, plants and animals).

Resilience

The ability to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner.

4. Enhance Preparedness and Response to Wildland Fire

MNR has a comprehensive wildland fire management program which supports an appropriate response to all wildland fires occurring within the fire region of Ontario. During the annual fire season period of April 1 to October 31, MNR's management of wildland fires is guided by practices, procedures and protocols to prepare for, predict, detect, assess and respond to wildland fire. This includes monitoring weather conditions from over 100 weather stations across the province, modelling moisture in the ground and vegetation, and monitoring forest health conditions. MNR also uses specialized weather forecasts and conducts daily planning and preparation procedures, including maintaining resources such as aircraft, facilities like fire bases and aviation bases, and an extensive inventory of fire-suppression equipment to support response. MNR's wildland fire rangers are trained and capable wildland firefighters, organized into crews that are stationed at Fire Management Headquarters throughout the fire region. Crews are often moved across the province (or even deployed nationally or internationally) to support firefighting efforts, as needed. Ontario shares wildland firefighting duties, resources and crews with communities (e.g., local fire departments and contract service providers) and other jurisdictions (Canadian provinces and territories, other countries) depending on the need and availability.

As Ontario experiences drier and more extreme fire conditions, and as communities and recreational and industrial activity expand into the wildland and into Ontario's Far North, wildland fires are likely to become more complex and difficult to manage. Under these scenarios, wildland fire preparedness and response demands will challenge MNR and local resources, service providers and mutual aid partners.

To enhance Ontario's preparedness and response to wildland fire, MNR is introducing improvements to:

- Ontario's wildland fire ranger workforce recruitment, retention, safety and training to support a safe, and experienced wildland fire, aviation and emergency management workforce.
- MNR information technology (IT) tools to support the increased demands and greater complexity of wildland fire management, and to support MNR's ability to use information technology to collaborate with partners, stakeholders and the public.
- Preparedness and response capabilities, strategies and tactics to meet the anticipated increasing future demands of wildland fire frequency and severity. This includes evaluating the effectiveness of aerial suppression techniques to inform future decisions, assessing aircraft types and numbers, and assessing where wildland fire facilities need to be located to best meet the demands of wildland fire and other natural hazard emergencies in the future.

Recognizing that many partners have demonstrated interest and value in responding to wildland fires and that increased capacity will at times be needed, MNR is exploring opportunities to build and improve partnerships with Indigenous communities, industry and other organizations. This will help ensure that enhanced preparedness and response capacity and resources

Discussion Questions

8. How should MNR better prepare and respond to wildland fires?
9. How could individuals, Indigenous partners, organizations and other governments better prepare and respond to wildland fires and how could capacity be enhanced?
10. What is needed for MNR and other emergency services, Indigenous partners, municipalities, and industry/ businesses to improve coordination and sharing roles and resources?

(including equipment, aircraft and personnel) are available when necessary, to respond to wildland fire emergencies. These partnerships will include a focus on the safety and interoperability (ability to exchange information, communicate, and work well together) of all partners involved in wildland fire response.

Potential changes to the *Forest Fires Prevention Act* under consideration are:

- **Develop with industry input a standard set of terms and conditions when privately owned equipment and operator(s) are hired for controlling or extinguishing fires. Timely access to heavy equipment is important to support activities to respond to a wildland fire. This proposal seeks to better define the arrangements between the ministry and others in a fair and transparent manner.**
- **Clarifying the Minister's authorities and orders during emergency situations (e.g., ability to issue implementation orders to outline what can and cannot be done in a wildland fire emergency area, and to allow exemptions in certain circumstances).**

5. Strengthen rules and consequences for non-compliance with forest fire laws

Warmer and drier conditions increase the likelihood of wildland fires occurring, including wildland fires caused by humans. Moreover, fires that occur during periods of warmer and drier conditions are more likely to become large or spread quickly. These wildland fire risks increase as residential and industrial development and infrastructure expand into new wildland areas. The rules and consequences for non-compliance with the *Forest Fires Prevention Act* play an important role in reducing the occurrence, and thus risks, of wildland fires, which helps to keep people and communities safe and reduces the response burden on government and wildland firefighters.

Wildland fires can be costly to contain and suppress. For example, suppression of the 2012 Timmins 9 Fire cost nearly $14 million, plus additional costs for lost stumpage and the cost of regenerating forests. The human-caused fire ignited and traveled at unprecedented rates of speed during the afternoon and late evening hours of May 20, 2012 and forced evacuations along Highway 144.

The *Forest Fires Prevention Act* sets out rules and consequences for non-compliance with the Act and its regulations. Enforcement of the Act involves conducting investigations of non-compliance, which could result in warnings, or charges being laid. The compliance and investigation aspects of the *Forest Fires Prevention Act* have not been updated in more than 50 years. By incorporating regulatory tools found in most other relevant provincial legislation, we can enhance the effectiveness of the Act and align with current best practices. Updating these provisions would enable the use of modern enforcement methods and remedies for non-compliance, The goal is to promote compliance and improve the ability to reduce unwanted wildland fire.

Discussion Questions

11. Are these proposals the appropriate enforcement and compliance measures to support compliance?

12. What additional measures or authorities should be considered to effectively encourage compliance with the Act or the regulations?

13. What further consequences should be contemplated for individuals, organizations and companies that fail to comply with the Act or the regulations?

Potential changes to the *Forest Fires Prevention Act* under consideration are:

- Enable the issuance of administrative monetary penalties for specific infractions, creating a more efficient, cost-effective method for addressing non-compliance. An administrative monetary penalty is a monetary fine that can be imposed on persons who fail to comply with certain provisions of an Act or regulation without having to lay a charge. This approach can result in a quicker resolution of matters and reduce the burden on the courts.
- Improving the options available to decide whether, when and how to recover the costs and damages incurred by the Ontario government due to human-caused wildland fires.
- Provide the tools and powers required to effectively hold individuals and/or corporations responsible for contravening the Act and regulations, such as:
  - Extending the limitation period for when charges may be laid to provide more time to carry out investigations and determine the appropriate course of action.
  - Creating additional officer powers, e.g., stop powers, arrest powers in certain circumstances.
  - Increasing the maximum penalty for individuals and increasing the imprisonment period.
  - Expanding inspection and search powers (e.g., production orders, warrants to conduct tests).
  - Allowing courts to issue a broad range of orders to encourage compliance upon conviction.

Wildland Fire Prevention

Activities directed at reducing fire occurrence; includes public education, law enforcement, modifying industrial activity and reduction of fire hazards and risks.

Wildland Fire Mitigation

Activities taken to reduce the undesirable impacts of wildland fires before they occur.

Canadian Wildland Fire Prevention and Mitigation Strategy

This past June, the **Canadian Wildland Fire Prevention and Mitigation Strategy** was released. The strategy promotes a resilient Canada where all parts of society are prepared, empowered and engaged in preventing and mitigating the negative impacts of wildland fires. The strategy highlights the key steps required to make progress towards this goal. Ontario is an active partner in the national wildland fire community and contributed to the development of the strategy, which was prepared on behalf the Canadian Council of Forest Ministers Wildland Fire Management Working Group.

Conclusion

In the coming years, a number of factors will increasingly challenge our ability to manage wildland fire risks. Continued population expansion and industrial activity will mean more people living and working in areas of high wildland fire potential. More variable and extreme weather patterns are expected to result in longer and more severe fire seasons in some areas. Changes in the duration and extent of drought and forests damaged by wind, insects and disease will create more complex situations for wildland fire managers and increase the risks for communities and industry.

These continuing environmental and socio-economic changes reinforce why our proposed wildland fire management vision is about working together – with residents, communities, Indigenous communities, industry, volunteers, and governments – to enhance collective capabilities and proactively reduce the risks and unwanted impacts of wildland fires. These changes are why it is increasingly important that a collective responsibility – by all Ontarians – is brought to the preparedness, prevention, mitigation, response to, and recovery from, wildland fire emergencies.

Providing Feedback

The ministry is seeking your feedback and ideas to help inform the wildland fire program and policy updates, and the development of potential amendments to the *Forest Fires Prevention Act*. Comments may be submitted on the Environmental Registry and the Regulatory Registry websites or by email to: WildlandFire@ontario.ca. Thank you for your participation.

Building on our Progress so far

Ontario is internationally recognized as a leader in wildland fire management; its resources to fight wildland fires include hundreds of staff trained and skilled in managing wildland fires, specialized aircraft, 14 fire management headquarters, and several other supporting facilities.

Building on the progress made in MNR's **Wildland Fire Management Strategy, 2014**, MNR has made recent investments to attract, retain and recognize wildland firefighting staff, and is continuing efforts to build collaborative community based approaches to wildland fire management.

Endnotes

1 Source information includes:

- Albert-Green A., Dean C.B., Martell D.L., and Woolford D.G. 2013. A methodology for investigating trends in changes in the timing of the fire season with applications to lightning-caused forest fires in Alberta and Ontario, Canada. Can. J. For. Res. 43(1): 39–45.
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2 Source information includes:

- Dean, C. & Martell, David & Woolford, Douglas. (2013). A methodology for investigating trends in changes in the timing of the fire season with applications to lightning-caused forest fires in Alberta and Ontario, Canada. Canadian Journal of Forest Research. 43. 10.1139/cjfr-2011-0432.
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- Flannigan, Mike & Cantin, M.D. & Groot, A.S. & Wotton, W.J. & Newbery, M. & Johnston, Lynn. (2013). Global wildland fire season severity in the 21st century. Forest Ecology and Management. 294. 64-71. 10.1016/j.foreco.2012.10.022.

3 Source information includes:

- Wotton, Mike & Martell, David & Logan, K.. (2003). Climate Change and People-Caused Forest Fire Occurrence in Ontario. Climatic Change. 60. 275-295. 10.1023/A:1026075919710.
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- Woolford, Douglas & Dean, C.B. & Martell, David & Cao, Jiguo & Wotton, Mike. (2014). Lightning-caused forest fire risk in Northwestern Ontario, Canada, is increasing and associated with anomalies in fire weather. Environmetrics. 25. 10.1002/env.2278.

5 Source information includes:

- Natural Resources Canada, Canadian Forest Service. Fire Regime. https://natural-resources.canada.ca/climate-change/climate-change-impacts-forests/forest-change-indicators/fire-regime/17780, and described in the Ontario Provincial Climate Change Impact Assessment Technical Report, 2023. 40, 62.

6 Source information includes:

- Albert-Green, A. et al. (2013). A methodology for investigating trends in changes in the timing of the fire season with applications to lightning-caused forest fires in Alberta and Ontario, Canada. *Canadian Journal of Forest Research.* 43(1): 39-45. https://doi.org/10.1139/cjfr-2011-0432