

Title: **THE CANADIAN WILDLAND FIRE STRATEGY**

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INTRODUCTION

Every summer, the media carry stories of wildfires raging across the Canadian landscape - threatening our communities, causing evacuations and, at times, burning public and private property. The portrayal of fire as a menace is often accurate, but it is only part of the story.

In Canada, fire is nature's primary way of keeping the wildlands we value and enjoy (including forests, grasslands, and parks) healthy and productive. Thus, we are faced with the complex and difficult task of managing wildland fires to maximize environmental benefits and minimize the risk to people and property. Recognizing that current and future challenges cannot be solved by traditional thinking and methods, the provincial, territorial and federal governments have collaborated, under the auspices of the Canadian Council of Forest Ministers (CCFM), on a new Canadian Wildland Fire Strategy (CWFS). Based on the principles of risk management, the proposal-driven CWFS addresses the symptoms and root causes of wildland fire management by modernizing our approaches and capabilities. The strategy provides a comprehensive vision of integrated activities that will increase public safety, improve the health and productivity of our forests, enhance intergovernmental cooperation, and apply public funds efficiently.

The CWFS builds upon decades of intergovernmental cooperation within the wildland fire management community in Canada and seeks to balance the social, ecological and economic aspects of wildland fire. It is designed to facilitate an innovative approach to wildland fire management in Canada that will (1) foster resilient communities by empowering the public; (2) develop healthy and productive forest ecosystems, and; (3) implement modern business practices. This report describes the current state of wildland fire management in Canada and provides recommendations on the changes required over the next 10 years.

WILDFIRES IN CANADA'S FORESTS

Fire has been a dominant feature in Canada's forests since the last Ice Age, particularly in the vast boreal region that stretches from the Yukon in the northwest to Newfoundland in the northeast. Many plant species - such as pine, spruce and birch - have adapted to fire and rely on it for their renewal. Fire has also created a mosaic of habitat types and ages needed by various animal species. Wildfires burned freely in most of Canada until the late 19th century when European-influenced views of fire and forestry started to result in policies that sought to suppress all fires.

Before European settlement of the country, the character of Canada's forests was shaped primarily by natural forces such as fire, insects, disease, wind, and natural regeneration. Early settlers used fire extensively to convert forested areas into farmland, but numerous disastrous wildfires, the adapted European approach to fire exclusion, and an expanding forest industry led to the development of fire control agencies across the country in the early 1900s.

Increased access to and use of Canada's forests for industrial and recreational purposes spawned a rise in both forest fire incidence and fire suppression capabilities. The primary objective of fire agencies has been to successfully control all wildfires through early detection and initial attack when fires are small.

Since 1980, an average of 8,600 wildfires have burned 2.5 million hectares. The area burned by wildland fires has fluctuated widely, from under 0.3 million hectares to more than 7.5 million hectares in extreme years; with increases in reported area burned over the past three decades. Lightning is responsible for an average of 35% of Canadian fires, yet these fires account for 85% of the total area burned, since they often occur in large numbers over wide areas that present access problems not usually associated with human-caused fires. Although these statistics apply to Canada as a whole, most fires are caused by people in some regions of the country.

Extensive analysis conducted by federal, provincial, and territorial government officials has found that the vulnerability of people, property, and natural resources to wildfire has reached an unprecedented level and is projected to continue to rise rapidly. The main reasons for this include increased frequency and more intense fires resulting from severe droughts and climate change impacts; insect infestations that leave dead and dry forests in their wake; and the growing number of homes, cottages, businesses and activities located in or near flammable forests. Meanwhile, current wildland fire suppression capacity is eroding as aircraft, facilities, and equipment age and experienced firefighting professionals retire. Many believe it is only a matter of time until another major fire season occurs again in Canada, with significant concern being expressed of the potential for loss of lives, as has been seen in other parts of the world.

WILDFIRE MANAGEMENT IN CANADA

More than 93% of Canada's 402 million hectares of forests and other wooded land is in the public domain. The vast majority is owned and managed by provincial and territorial governments, with a small proportion (e.g., national parks and First Nations lands) under federal responsibility. The remaining 7% is privately owned. Although governments continue to search for a balance among preservation of environmental quality, enhancement of economic wealth,

and development of social benefits for the well-being of all Canadians, the economic importance of Canadian forests is beyond question. Canada's \$82 billion forest industry directly employs more than 376 000 people and contributes \$33 billion to Canada's gross domestic product. In addition, more than 300 communities depend on the bounty of the forest for their livelihoods.

In Canada, responsibility for forest and fire management rests with each of the 13 autonomous provinces and territories. The federal government is responsible for fire management in national parks, where a greater emphasis is placed on the use of prescribed fire. Annual fire suppression costs have risen steadily in Canada and currently average about \$500 million, not including public and industrial losses. Four provinces with large fire management organizations — British Columbia, Alberta, Ontario, and Quebec — generally account for about 80% of total Canadian expenditures.

Canada's wildland fire suppression systems are largely successful, and the vast majority of fires (about 97%) are contained at less than 200 hectares. However, the approximately 3% of fires exceeding 200 hectares account for up to 98% of the total area burned. Canada's initial-attack success is similar to that in the United States and Australia, which also have sophisticated fire suppression programs. Fires in excess of 100,000 hectares are not uncommon in Canada, and fires exceeding 1 million hectares have been recorded, most of them occurring in the remote "modified suppression" zones, primarily in the northern regions of western and central Canada.

There are times, however, when Mother Nature creates conditions that make wildfires unstoppable. As increasing numbers of Canadians live, work, and play in or near flammable vegetation, wildfires are posing a greater threat to public safety. Over the past 10 years, more than 700,000 people have been threatened by wildfires in over 200 communities — many of which are inhabited by Aboriginal peoples. A recent, vivid example occurred in western Canada in 2003, when

hundreds of homes were lost, tens of thousands of people were evacuated, and combined damage and firefighting costs exceeded \$1 billion.

The economic and recreational importance of the forests and the need to protect life and property are the primary reasons that Canada has developed one of the world's most sophisticated forest fire management programs and why forest fire management activities conducted by the provinces, territories, and Parks Canada constitute the most expensive element of forest management in Canada. In an extreme fire season, fire suppression expenditures can reach \$1 billion, with hundreds of millions of dollars of additional damage to public and private resources. Expansion of the forest industry over the past century, in many cases by capitalizing on increased timber supply due to reduced fire activity, has resulted in the forest sector becoming one of the largest contributors to Canada's economy. Reconciling the role of fire in maintaining the ecosystem with the need to protect life, property, and other values at risk is a complex challenge.

THE CHANGING CONTEXT

During the late 1970s and early 1980s, it became apparent that total fire exclusion was neither economically feasible nor ecologically desirable. There also was an expanded awareness among fire managers of the important role of natural disturbances in maintaining ecosystem health, productivity, and biodiversity. This awareness fostered a new fire management strategy in which consideration is given to the ecological role of fire, the economics of suppression, and the priority of values at risk. Currently, the Wildland–Urban Interface (WUI), where structures are adjacent to or intermixed with flammable vegetation and high-value forest industry and recreational sites, typically receive intense protection. Alternatively, wildfire is often allowed to behave more naturally in non-commercial areas such as wilderness parks or remote forest areas of limited economic value.

The complexity of wildland fire management has increased rapidly as a result of many social, economic, political, and ecological factors. First, there was a shift in resource management philosophy toward sustainable development, which introduced an integrated web of multiple and at times conflicting social, economic, and ecological demands that wildland fire management policies and activities have had to attempt to reconcile. In particular, this new philosophy acknowledges the dynamic nature of forest ecosystems and the need to manage for the good of both present and future generations.

Second, the globalization of the forest industry is affecting Canada's market share, moving the industry toward increased consolidation as it tries to remain competitive. The pressure for a secure wood supply is perpetuating the demand for fire exclusion, even where it is not physically or economically possible, let alone ecologically desirable.

Third, more people are living in the WUI. Throughout the country, especially in Ontario and Quebec, the sale of recreational properties is booming, and in parts of western Canada there is rapid growth in the number of permanent and seasonal residences being built in or near the forest. In addition, Aboriginal communities, 80% of which are forest-based, are growing rapidly. Most newcomers to forest living have little or no awareness of the role of wildland fire and its potential dangers.

A fourth factor is the information explosion. The Internet and 24-hour news channels tend to feature the sensational, negative side of wildland fires, with little recognition of their ecological benefits. Access to and desire for information places new demands on politicians and practitioners, who may have limited experience in media and public relations; however, it also provides a significant opportunity to bring complex issues to the public's awareness.

EMERGING ISSUES, CHALLENGES, AND RISKS

Public values and attitudes concerning the forest and its management are constantly changing. Current approaches to solving forest-related issues need to be adapted to meet the future needs.

Few new communities have building codes requiring that homes be resistant to wildland fire or requirements for management of forest fuel. Hazard-mitigation programs are being initiated on a limited scale by a number of provincial, territorial, and municipal agencies, but in the absence of official Canadian standards. Forest-based communities in Canada also require protection from both the direct threat of fire and from the indirect impacts threatening the resource that sustains these communities.

The attempted exclusion of fire in some regions of Canada has led to a shift to older forests. This shift could lead to significant changes in wildfire potential, with fires of higher intensity resulting from changes in fuel structure and quantity. Changing forest conditions can also encourage infestations of insects, such as the mountain pine beetle and spruce budworm, which could lead to large fires fuelled by excessive dead woody material.

In many regions of Canada, most of the economically accessible, merchantable forest area has been designated for commercial harvest, for other competing land uses (such as other natural resources and non-timber forest products), or for protection (e.g., parks or wilderness). There is significant pressure for more forest areas to be set aside for uses such as recreational activities and biodiversity conservation. Aboriginal groups are seeking expanded access to forest lands for traditional pursuits. All of these factors have eliminated the buffer stocks that have historically been available to forest and land managers to offset major losses to wildland fire.

WHY IS THE CWFS NEEDED?

The public and various stakeholders are increasingly involved in resource management decisions, but they typically consider the protection of their values a government responsibility. Wildland fire management has become an issue for all levels of government, which must together effectively engage all constituents and stakeholders to share and manage risks.

Climate change research indicates that the incidence and severity of wildfires will greatly increase over the next century (by one estimate, the area burned annually in Canada could double by 2040), which will make sustainable forest management as currently practised particularly difficult. There will be extreme pressure on Canadian wildland fire management agencies, because today's fire suppression practices will not be as successful and current performance objectives may not be attainable under a warmer and drier climate. Such pressure will have a direct effect on wood supply and the competitiveness of the forest industry and affect forest-dependent communities. Warmer, drier conditions could mean more frequent fires, a shift toward younger forests, and a decrease in carbon storage. Increased carbon emissions through more severe forest fires and increased vulnerability of carbon-rich peatlands to future burning under drier conditions may affect Canada's commitment to carbon sequestration and emissions reductions under the Kyoto Protocol.

The ability to manage wildland fire in Canada becomes more limited with increases in fire incidence and values needing protection. The effectiveness of suppression as practised today is near its physical limit; therefore, future gains achieved with current approaches will be smaller and costlier than in the past. Current suppression capacity is eroding as aircraft, facilities, and equipment age, while fire management costs are on the rise and fire management agencies frequently experience constraints on their budgets. Equally challenging is the current demographic characteristics of fire management personnel in Canada,

with many well-trained and experienced staff retiring and a limited ability to recruit adequate replacements in a competitive marketplace.

IMPLEMENTATION OF THE CWFS

Specifically, the CWFS will seek to develop resilient and empowered communities, healthy and productive forest ecosystems, and modern and efficient business practices.

The following initiatives will contribute to this mission.

Resilient communities and an empowered public

- Inform and engage the public through wildland fire awareness and information initiatives and communicate the appropriate response concept to professionals, politicians, and the public.
- Share responsibility through development of integrated government policies clearly defining the risks, roles, and responsibilities of all constituencies (individuals, communities, and municipal, provincial, territorial, and federal governments).
- Minimize the risk to public safety and property by developing and implementing a Canadian FireSmart initiative with distinct components addressing mitigation, preparedness, response, and recovery.
- Initiate a directed and integrated program of physical and social science research and technology transfer on WUI issues.

Healthy and productive forest ecosystems

- Integrate and periodically review land, forest, and fire management policies and practices based on the biological, ecological, and physical characteristics of wildland fire.
- Reintroduce and/or maintain fire on parts of the landscape by appropriate means, including prescribed fire, with the goal of maximizing biodiversity, ecological integrity, and productivity in fire-dependent ecosystems.

Modern business practices

- Maintain an economically efficient and world-class wildland fire preparedness and response capability through long-term replacement of deteriorating equipment and infrastructure, implement Canadian training standards, and recruit and train personnel at universities and community colleges.
- Build effective partnerships and innovative institutional arrangements for reducing inter-annual variability of wildland fire management expenditures through the development and operational use of a Canadian interagency operational preparedness system, and foster effective communication and adaptive management through Canada-wide workshops and information sharing sessions.
- Develop innovative risk and cost-sharing approaches consistent with insurance principles.

- Adopt a culture of continuous improvement in policy and practice by establishing a collaborative analysis group to carry out policy assessments and analyses of level of protection, and initiate a directed program of fire science and innovation coupled with a comprehensive program of technology transfer.

MOVING FORWARD

A new approach to wildland fire management in Canada will require changes in the attitudes and actions of individuals, stakeholder groups, the private sector, and various levels of government. The underlying tenet is that managing the risks from wildland fire is a shared responsibility needing integrated and cooperative actions. Two specific elements have been identified as prerequisites for moving wildland fire management from its current state to the desired future state, namely a common set of principles that provincial, territorial, and federal governments will strive to achieve plus a comprehensive set of strategic initiatives that organizations commit to accomplishing through independent, collective, and bilateral activities. The later element will require significant financial resources (likely in excess of \$2 billion over the next 10 years), but these investments will accelerate the ability to implement enhanced wildland fire management policies and practices.

To achieve the desired future state, four strategic initiatives have been identified as essential. Two of these are fundamental enablers of change: public awareness, policy and risk analysis; and innovation. The other two initiatives, a Canadian FireSmart initiative and an enhanced wildland fire preparedness and response capability, will foster immediate action on the most urgent issues and concerns. Through these initiatives a suite of activities will contribute to the mission of developing resilient communities and an empowered public, healthy and productive forest ecosystems, and modern business practices.

DESIRED FUTURE STATE

The CWFS is a catalyst to help all Canadians understand and manage the presence of fire on the landscape. It will facilitate new policies and well-integrated implementation by wildland fire management agencies. Forest and land management plans must balance the social, ecological, and economic aspects of sustainable forest management.

Under the CWFS, Canadians will become knowledgeable about the role of wildland fire on the forest landscape, its characteristics, the capabilities of fire suppression, and the potential impact of fire on ecosystems, communities, and individual homes. Responsibility will be shared among all affected individuals and organizations, and extensive programs of mitigation, preparedness, response, and recovery will be carried out.

Fire exclusion policies will give way to an era of well-conceived wildland fire management in which policies reflect an understanding and acceptance of fire as maintaining Canada's healthy and diverse ecosystems. Adaptive management will maintain or enhance the ecological integrity and productivity of forest ecosystems while protecting the material values of society. When large, uncontrollable wildfires occur, more emphasis will be placed on the protection of values such as homes, key watersheds, and critical stands of timber; and less on high-cost, low-probability fire control techniques. The effectiveness of fire suppression will increase when it is used in combination with proactive mitigation strategies such as fuels management.

Wildland fire management agencies will adapt by upgrading policies and practices to ensure public safety and security. Fire management policies at all levels will use risk analysis and risk management combined with timely information on public values, as well as economic and ecological values across

management areas. Canada's wildland fire preparedness and response capabilities will be enhanced through effective training, the upgrading of aging and non-functional equipment and infrastructure, continued implementation of scientifically based decision support systems, and the development of new business models and institutional arrangements. These enhancements will improve institutional efficiency, expand operational effectiveness and increase public safety.

CONCLUSION

The presence of wildland fire on the Canadian landscape will continue and likely increase. Attempting to eliminate wildland fire to reduce its impact is no longer a reasonable solution. Canadians must learn to coexist with this natural process. Some adaptations will happen quickly and others will take time, but with the right mix of principles and actions over a 10-year period, institutional and individual inertia will be overcome and Canada will be headed down this new path. Both the root causes and the symptoms of the issues must be addressed in an integrated manner. There is no single solution because this is a complex challenge occurring within a dynamic and highly variable environment; however, by working together the risks associated with wildland fire can be effectively managed through the implementation of the innovative and integrated elements of the CWFS.

The CWFS is an ambitious initiative and at first glance, it may appear costly. In the face of increasing threats from wildfires, however, it is an investment that will avoid escalating costs and losses in the future. When implemented, the CWFS will make Canada's wildland fire management policies and programs among the most progressive in the world – thereby enhancing the safety of Canadians, facilitating the sustainability of our forests, and ensuring the efficient use of public funds.