

## **PAM 7.02.01; AFFES: FM:2:12**

# **Fire Management Planning Guideline for Provincial Parks and Conservation Reserves**

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### **SUMMARY**

Fire is an essential natural process for maintaining and restoring ecological integrity. The purpose of the guideline is to assist staff in developing fire management direction for provincial parks and conservation reserves. Fire management direction guides the preferred wildland fire response and use of prescribed burning to achieve the ecological benefits of fire, while protecting assets and resources.

Guidance is provided on:

- Assessing opportunities for wildland fire and prescribed burning;
- Identifying assets and resources requiring protection;
- Documenting fire management direction in a protected area management plan or a fire management plan;
- Preparing assets, resources and opportunities maps to guide implementation.

The guideline supports implementation of the Fire Management Policy for Provincial Parks and Conservation Reserves. It also complements the Wildland Fire Management Strategy for Ontario, which provides broader provincial direction for protecting public safety and property, minimizing social and economic disruption, and managing costs.

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### **RÉSUMÉ**

Le feu est un processus naturel essentiel pour l'entretien et la restauration écologique. La ligne directrice vise à aider le personnel à élaborer une orientation de gestion des incendies dans les parcs provinciaux et les réserves de conservation. L'orientation de gestion des incendies établit la meilleure façon de procéder aux feux de végétation et le recours au brûlage dirigé pour obtenir des avantages écologiques, tout en protégeant les biens et les ressources.

Des conseils sont fournis pour :

- évaluer les possibilités du recours au feu de végétation et au brûlage dirigé;
- cerner les biens et les ressources qui doivent être protégés;
- documenter l'orientation de gestion des incendies dans un plan ou une déclaration de gestion des zones protégées, ou dans un plan de gestion des incendies;
- préparer les cartes liées aux biens, aux ressources et aux possibilités pour orienter la mise en œuvre.

La ligne directrice appuie la mise en œuvre de la Politique relative à la gestion du feu dans les parcs et les réserves de conservation et de la Stratégie de gestion des feux de végétation de l'Ontario. La ligne directrice appuie aussi la Stratégie de gestion des feux de végétation de l'Ontario, qui fournit une orientation provinciale plus large pour protéger la sécurité et les biens du public, minimiser la perturbation sociale et économique, et gérer les coûts.

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### **1.0 INTRODUCTION**

The Fire Management Policy for Provincial Parks and Conservation Reserves (MECP and OMNRF 2020 draft) establishes an approach for informing the appropriate response to wildland fire in provincial parks and conservation reserves and identifying opportunities for prescribed burning. As per the policy, the goal of fire management is to “protect public safety and promote and encourage the use of fire as a natural ecological process for the maintenance and restoration of ecological integrity”. The protection of human life and property is recognized as the overriding consideration for wildland fire response and prescribed burning, as directed in broader provincial policies and operational guidance.

The purpose of this guideline is to assist staff in developing and in supporting implementation of fire management direction in accordance with the associated policy. Guidance is provided on: information and analysis needed to assess opportunities for wildland fire and prescribed burning; identify assets and resources requiring protection; document fire management direction, and; prepare assets, resources and opportunities maps.

Effective fire management relies on defining clear management objectives and actions, monitoring and assessing outcomes, and updating direction so it is responsive to new and changing circumstances. Many factors influence the type of fire objectives and fire management options that are available. Early contact and ongoing communication between staff of MECP’s Ontario Parks and the Ministry of Natural Resources and Forestry’s Aviation, Forest Fire and Emergency Services (AFFES) will ensure that the identified fire management approaches are feasible and suitable for achieving the resource management objectives of the provincial park or conservation reserve.

This guideline supports the MNR’s mandate to protect and sustainably manage Ontario’s natural resources. This mandate includes the responsibility to lead the prevention and mitigation of, preparedness for, response to and recovery from wildland fires. The guideline also strengthens the implementation of the Wildland Fire Management Strategy (OMNRF 2014a), which provides strategic direction for the management of wildland fire in Ontario. Fire management in provincial parks and conservation reserves is also guided by other legislation, policy and strategic direction (Appendix 1).

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Nothing in this guideline shall be construed to abrogate or derogate from the protection provided for the existing Aboriginal and treaty rights of the Aboriginal peoples of Canada as recognized and affirmed in section 35 of the Constitution Act, 1982.

## **2.0 OVERVIEW OF REQUIREMENTS FOR PREPARING FIRE MANAGEMENT DIRECTION**

The Fire Management Policy for Provincial Parks and Conservation Reserves (MECP and OMNRF 2020 draft) requires that fire management direction be prepared for each area. Fire management direction guides the preferred wildland fire response and use of prescribed burning to achieve the objectives of the provincial park or conservation reserve.

This section provides an overview of requirements for:

- Establishing fire management direction through planning;
- Preparing assets, resources and opportunities maps to support implementation of fire management direction;
- Responsibility for preparing direction and supporting implementation, and;
- Planning considerations, including general requirements for consultation and engagement.

### **2.1 Establishing fire management direction through planning**

Fire management direction is established for every provincial park and conservation reserve through management planning.

#### ***Management plans***

Management plans provide site-specific management policies for provincial parks and conservation reserves and include broad direction on fire management. Guidance on preparing fire management direction for management plans is provided in **Section 3**.

#### ***Fire management plans***

A fire management plan is a type of secondary plan that may be prepared at the discretion of the provincial park or conservation reserve manager in particularly complex situations when additional planning is needed to develop specific objectives to be achieved through wildland fire response, or to guide extensive or complex prescribed burning programs. Guidance for preparing fire management plans is provided in **Section 4**.

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### ***Other types of fire management direction***

Fire response plans have, in the past, been prepared for some provincial parks and conservation reserves. The direction in these plans remains in effect for the term of the plan. Fire response plans will be replaced with an assets, resources, and opportunities map or a fire management plan after the fire response plan expires.

### ***Other types of management plans***

Fire management planning requirements may be incorporated into other management planning projects that include provincial parks or conservation reserves. This may be a desirable option if fire is only one of several methods that are intended to be used to achieve diverse management goals. For example, vegetation management may be undertaken for a variety of reasons such as invasive species control, restoration of rare ecosystems and enhancement of wildlife habitat. Fire may have only a minor role, or be used in combination with other methods, to address broader vegetation and habitat management objectives. Applying this guideline to develop fire management content for other types of plans will help to ensure that critical elements such as assets and resources are identified, and risks are adequately addressed.

## **2.2 Implementing fire management direction**

Implementing fire management direction is supported by:

- Assets, resources and opportunities maps which must be prepared for all provincial parks and conservation reserves (except those with a municipal agreement or located in municipal protection areas) to guide wildland fire response;
- Prescribed burn plans which are developed and implemented in accordance with provincial policies and protocols.

### ***Assets, resources and opportunities maps***

As per the Wildland Fire Management Strategy, all wildland fires inside the Fire Region of Ontario, including those in provincial parks and conservation reserves, are assessed and receive an appropriate response. Assets, resources and opportunities maps support decision-making about the appropriate response at the time of a wildland fire.

These maps identify compartments and fire levels (limit fire, allow fire, prescribe fire) focussed on protecting assets and resources that could be adversely affected by wildland fire, and identifying areas that would benefit from fire. Guidance for preparing assets, resources, and opportunities maps is provided in **Section 5**.

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### *Prescribed burning*

Prescribed burn planning and implementation is not addressed by this guideline. Refer to the Prescribed Burning Operations Policy and the Prescribed Burn Manual.

### **2.3 Responsibility for preparing fire management direction**

Provincial park and conservation reserve managers are responsible for ensuring appropriate fire management direction is established, and for supporting implementation in collaboration with wildland fire managers.

Fire management planning is done collaboratively between Ontario Parks and AFFES, and plans are approved by appropriate managers.

Preparing fire management direction and assets, resources and opportunities maps relies on expertise and skills related to planning and management, fire response and operations, geographic information system (GIS) analysis and information management. The list below provides examples of areas of expertise that would be useful to include on the planning team:

- Provincial park and conservation reserve planning, management and operations;
- Fire management planning;
- Ecological integrity and ecology of the provincial park or conservation reserve and surrounding landscape;
- Knowledge of local Indigenous community interests, Indigenous engagement and/or representation from local Indigenous communities;
- Fire ecology, fire science/behaviour, including potential effects of climate change;
- Fire operations;
- GIS analysis, modelling expertise (e.g. fire growth, fire probability, climate change projections, etc.).

### **2.4 Planning considerations**

While this guideline establishes the process for preparing fire management direction and assets, resources and opportunities maps for provincial parks and conservation reserves, other planning considerations include:

- Direction in management plans is established and consulted on as part of a comprehensive planning process (OMNRF 2014b);
- Amendments to management plans may be needed to consider alternative or specific fire management opportunities to support assets, resources and opportunities mappings (see **Section 8.1**);



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- Assets, resources and opportunities maps can be prepared at any time over the term of the approved management plan during management planning, or as part of a fire management plan;
- Other processes that may require additional evaluation and notification prior to implementation.

**2.5 Indigenous involvement**

Indigenous peoples have lived with fire as a vital ecosystem process for millennia and continue to do so. Fire was used as a tool to help shape the landscape to meet community needs. Elders and other knowledge keepers may have extensive knowledge of fire and its ecological role, cultural use, historical fire regimes and changes to the patterns of fire occurrence. Indigenous communities may also have concerns about potential impacts of fire management decisions on their resources and assets.

The involvement and contributions of Indigenous communities provides valuable information, expertise and experience for developing fire management direction and supporting implementation. Indigenous communities should be engaged early in the fire management planning process. Early and ongoing discussion provides the opportunity for information and knowledge that is shared to be understood and integrated with other information sources.

All involvement opportunities available to the public are also available to Indigenous communities. However, a customized approach to Indigenous involvement may best meet the unique needs and interests of each community. Indigenous communities may identify the level of involvement that will work best based on community priorities and perspectives. Refer to relevant guidance (e.g., *Ways of Knowing – A Primer for Traditional Ecological Knowledge in Natural Resource Management* (OMNRF 2018a)) on considering, integrating and including traditional ecological knowledge in a respectful and meaningful way. Staff should seek ministry advice, work with Indigenous communities to determine their preferences and develop a suitable approach.

If a community chooses not to participate, staff should respect the choices of the community but continue to share information during the planning process (see **Section 2.6**). Where established or asserted Aboriginal or treaty rights may be adversely affected, the Ministry has a legal duty to consult in a way that is meaningful and, where appropriate, make reasonable efforts to accommodate Aboriginal and treaty rights.

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### **2.6 Engagement and consultation**

Engagement and consultation on fire management direction is carried out during management planning. The Guideline to Involvement During Protected Areas Management Planning (OMNR 2014c) describes the process for engaging and consulting with Indigenous communities, potentially affected stakeholders and the public during management and secondary planning (including fire management planning). An involvement strategy is typically developed that outlines consultation and engagement approaches for the planning project.

Assets, resources and opportunities maps reflect fire response direction and/or management intent in approved management direction. Managers of provincial parks and conservation reserves may decide to notify adjacent land owners, local communities and certain stakeholders when preparing these maps, through approaches determined at the local level.

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**3.0 MANAGEMENT DIRECTION FOR PROVINCIAL PARKS AND CONSERVATION RESERVES**

Management direction guides protection, development and management of provincial park and conservation reserve values and resources over a 20-year period. Management plans are prepared in accordance with Ontario's Protected Areas Planning Manual (OMNR 2014b) and associated guidelines. Site-specific policy for fire management is established through planning. This section provides guidance on establishing fire management direction during management planning.

**3.1 Purpose of the fire management section**

The fire management section in a management plan sets:

- Broad direction on opportunities for wildland fire benefits;
- Specific direction on prescribed burning opportunities; and,
- Mitigation measures to reduce wildland fire risks to assets and resources.

**3.2 Preparing the fire management section**

There are four general steps in preparing the fire management section:

1. Determine the fire regime
2. Assess opportunities for wildland fire benefits
3. Determine fire management direction
4. Document direction in plan

**3.2.1 Determine the Fire Regime**

Knowledge of Ontario's fire regimes and how they may change in the future will assist with determining where opportunities for beneficial fire exist. Wildland fire should be promoted as an important ecosystem function to support species and communities that have adapted to and depend on fire. Descriptions provided by Van Sleetwen (2006) are a good basis for understanding the regional fire regime for management planning. In addition, Indigenous communities may provide traditional knowledge about the fire ecology of a region and changes to the fire regime.

Where information is available, also examine how the historic fire regime has shaped the vegetation communities of the provincial park or conservation reserve and the ecological impacts of fire exclusion. This information can be used to develop objectives to be achieved through fire management, such as a future forest composition and structure that maintains or restores ecological integrity. See **Section 4.2.2** for further

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discussion on the fire regime, and **Appendix 2** for additional sources of information for assessing the fire regime.

#### Text Box 1 – Fire regimes

A fire regime is described by the following characteristics: frequency, cycle, magnitude, type, spatial extent and seasonality. Fire regimes vary across the province. In some areas, such as the boreal forest, fire is the dominant natural disturbance agent directly influencing the composition, structure and pattern of vegetation, as well as indirectly influencing the distribution and abundance of wildlife populations. In other areas such as the deciduous forest region, naturally ignited fire was historically less common but essential for maintaining fire dependent communities such as tallgrass prairie and savannah (Van Sleetuwen 2006).

#### 3.2.2 Assess opportunities for wildland fire benefits

Opportunities for wildland fire benefits are assessed based on:

- Location of the provincial park or conservation reserve relative to the Fire Region of Ontario;
- Risk to assets and resources;
- Potential to mitigate risks of negative impacts.

These considerations are described below and summarized in **Figure 1**.

#### *Fire Region of Ontario*

The fire Region of Ontario is defined by the Forest Fires Prevention Act, R.S.O. 1990 (FFPA). MNRF is responsible for wildland fire management in provincial parks and conservation reserves; however, fire response is provided by the local municipality in many areas. Specifically, municipalities are responsible for fire response in:

- All areas that are outside the Fire Region of Ontario;
- Provincial parks and conservation reserves inside the Fire Region that are within municipal protection areas.

Generally, most municipalities do not have the capacity to manage wildland fires for ecological benefits, therefore fire response tactics are limited to suppression of wildland fires. This approach is applied in provincial parks and conservation reserves where municipalities are responsible for fire response. In exceptional circumstances, alternative responses may be negotiated with the municipal fire department with the appropriate training and under low risk conditions.

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Inside the Fire Region, OMNRF can provide a range of wildland fire response options based on conditions at the time of fire, availability of resources and management interests.

#### ***Risk to assets and resources***

Consideration should be given to all natural, Indigenous, cultural and socio-economic assets and resources that may be affected, either beneficially or detrimentally, by wildland fire.

In general, there may be opportunities for beneficial wildland fire in provincial parks and conservation reserves where there are few or concentrated areas of assets and resources that could be adversely affected by fire. Where many assets and resources are spread across an area, or otherwise if the risk to assets and resources is too high, there is likely no or limited opportunity for wildland fire. Also consider if risk can be decreased to an acceptable level through mitigation measures such as reducing fire hazards near assets and resources or by managing fuels.

#### ***Mitigating risk of negative impacts***

Areas affected by insect infestation, disease or blowdown, or with a history of fire exclusion, can have a build-up of dead or dying wood which can become a fire hazard to nearby assets and resources. Protecting assets and resources, such as buildings or a campground, may be difficult if a wildland fire were to occur in proximity to a hazard area.

FireSmart is an example of a mitigation program that focuses on how individuals and communities can work together to reduce the risk of loss from wildland interface fires (OMNRF 2015). FireSmart includes tools for assessing and identifying areas with high or extreme wildland fire hazard potential around structures and facilities.

The effects of climate change on fire risks should also be considered in determining if wildland fire prevention measures are needed. A higher priority to mitigate fire risks may be assigned if assets and resources are near hazardous fuels, particularly in areas such as northwestern Ontario where the increase in frequency and severity of fires is expected to be the greatest (Natural Resources Canada 2018, Wotton et al. 2005).

Mitigating fire hazards can support protection of assets and resources; however, actions to reduce hazards also have the potential to negatively impact ecological integrity. For example, some vegetation management can alter the structure or composition of a forest ecosystem, such as thinning the understory adjacent to a campground, or

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planting fire resistant vegetation (e.g., deciduous species). Potential impacts on ecological integrity should be considered in determining the appropriate actions to reduce fire hazards.

### **Other considerations**

In the past, size, location and use were criteria for precluding wildland fire opportunities in many provincial parks and conservation reserves. Small operating parks adjacent to highways or communities, and those with a linear configuration where adjacent forestry or other resource management occurs, would not have been candidates for wildland fire. However, every wildland fire is assessed for appropriate response inside the Fire Region. Opportunities for ecological or other benefits from fire should be considered in every provincial park and conservation reserve.

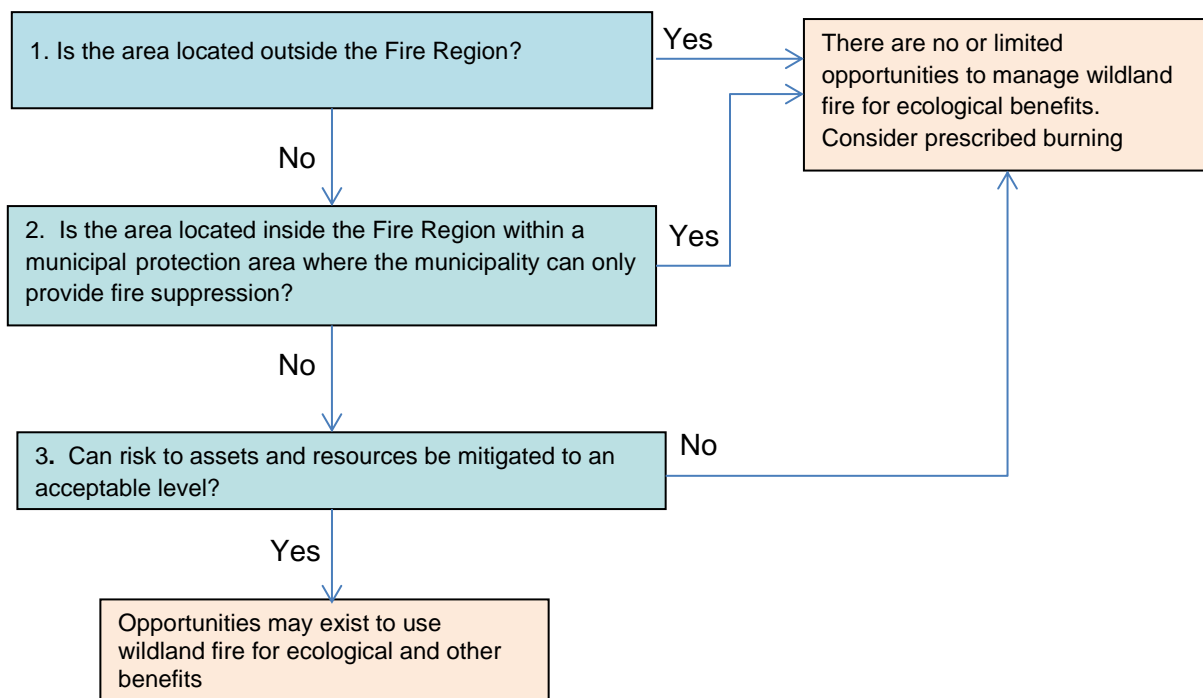


Figure 1. Decision tree for assessing opportunities for wildland fire benefits.

### **3.2.3 Determine fire management direction**

#### **Wildland fire opportunities**

An assessment of opportunities for beneficial wildland fire should lead to one of two conclusions:

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1. There are no or limited opportunities for wildland fire in the park or reserve due to high risk of negative impact to assets and resources, or;
2. There may be opportunities to use wildland fire safely and effectively to meet ecological and other benefits in some or all of the provincial park or conservation reserve.

Once wildland fire opportunities have been determined, specific management interests and the role of fire to support those interests are assessed.

#### ***Management interests***

Fire can support management interests for provincial parks and conservation reserves by providing an essential ecological function or as a resource management tool. The protection objective for these protected areas will usually include maintaining or restoring ecological integrity, which may rely on reintroducing fire as a natural process. Use of fire may also play a key role in addressing specific management needs and opportunities such as:

- Restoring habitat;
- Controlling invasive species;
- Reducing hazardous forest fuels;
- Maintaining or restoring fire dependent ecosystems;
- Creating natural fire breaks (e.g., conducting a prescribed burn to create an open area in a forest to prevent the spread of fire);
- Adapting to climate change;
- Educating the public.

Indigenous communities may identify interests related to traditional burning or the protection of cultural assets or resources which should be considered in developing fire management direction.

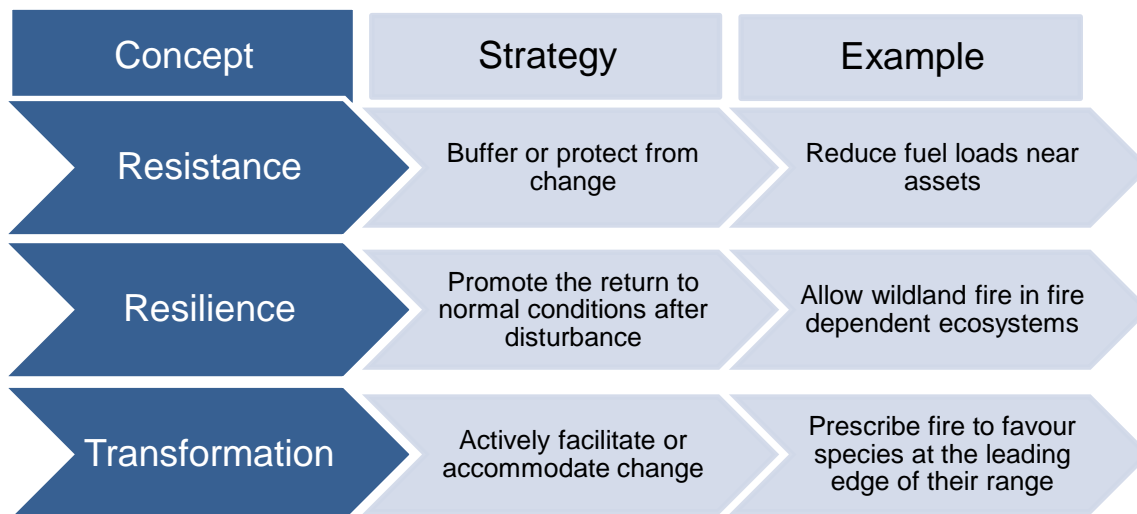
#### ***Climate change impacts and adaptation***

Climate change adaptation or mitigation strategies developed during management planning should be considered in setting fire management direction. Fire regimes are expected to change with an increase in the frequency, intensity and severity of fires in many parts of the province (Wotton et al. 2005, McDermid et al. 2015). Planning teams should consider the impacts of climate change on the provincial park or conservation reserve and how the current and future fire regimes could affect management interests.

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The concepts of resistance, resilience and transformation (**Figure 2**) are useful for identifying how fire management could contribute to climate change adaptation. For example, fire management could be used to:

- Resist undesirable conversion of a vegetation community by protecting it from severe fires (e.g., conversion of forest on thin soils to rock barren);
- Improve the resilience of a fire adapted ecosystem by allowing fire (e.g., renewal of old growth pine forest);
- Facilitate the transformation of an existing vegetation community to a climate adapted ecosystem by allowing fire (e.g., conversion to a more resistant species).



**Figure 2. Climate Change Adaptation Concepts (adapted from OMNRF 2018b).**

Consider impacts to ecological integrity and the potential for negative impacts before applying these strategies. In general, the level of uncertainty is expected to be lower for resilience and resistance strategies that have well established methods and outcomes. In contrast, transformation approaches that are novel and untested are likely to have a high level of uncertainty and may not be appropriate to apply in a provincial park or conservation reserve.

Fire management in can also be directed to reduce fuel loads (e.g., the quantity of wildland vegetation materials that can burn) and thereby mitigate the risks of more extreme or frequent wildfire events.



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#### ***Prescribed burning***

Prescribed burning is appropriate if there are management interests or objectives for a defined area, within a definite timeline, or a type of fire (e.g., crown versus surface fire) is required to achieve desirable outcomes. Site-level outcomes to meet specific management interests are more likely achievable through prescribed burning than by the management of wildland fire.

Although wildland fire is a desirable natural agent of renewal in many ecosystems, it can also be a destructive force that threatens assets and resources. Prescribed burning can be applied more safely and efficiently under a defined set of conditions in highly developed areas where the risks of a managed wildland fire are too great. Prescribed burning should also be considered as an alternative to the extensive use of wildland fire under prescription, which is more complex and less efficient to implement.

#### **Text Box 2 – Prescribed burning opportunities**

Prescribed burning will be the only option for achieving ecological benefits of fire in provincial parks and conservation reserves with no or limited opportunities for wildland fire. Prescribed burning should also be considered where wildland fire opportunities exist, but resource management interests are unlikely to be fully achieved through appropriate response within an acceptable timeframe

#### ***3.2.4 Document fire management direction in management plans***

Management plans set direction for fire management based on the assessment factors in **Section 3.2.3**.

Where there are no or limited opportunities for the use of wildland fire, make this statement and explain why.

Where there are opportunities for wildland fire or prescribed burning, a more robust discussion is needed to rationalize the decision based on assessment factors and management interests for the provincial park or conservation reserve. Recommended content includes:

- Description of the ecological role of fire, the current and projected future fire regimes, as well as effects of the historic fire regime on vegetation communities where this information is available;
- Identification of specific resource management interests to be achieved through wildland fire management and prescribed burning (e.g., changes to vegetation composition and structure to maintain or restore ecological integrity);

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- Mitigation to reduce fire hazards;
- Need for more detailed fire management planning, if necessary (e.g., fire management plan);
- Description of ongoing fire management activities (e.g., prescribed burning, implementation of fire management plans).

#### 3.3 Detailed fire management planning

Broad direction in a management plan will be adequate for most provincial parks and conservation reserves located in municipal agreement or protection areas.

Provincial parks and conservation reserves without municipal agreements and for which OMNRF is responsible for fire response, will require assets, resources and opportunities mapping (see **Section 5**).

There may be situations where more detailed fire management direction is needed. Further fire management planning should be considered when:

- There are specific ecological targets;
- Complex assets and resources protection issues exist;
- An extensive or complex prescribed burning program is intended.

**Section 4** provides further information about when fire management plans may be appropriate and how to prepare them. Follow the Prescribed Burn Manual for prescribed burn planning and implementation.

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## **4.0 FIRE MANAGEMENT PLANS**

### **4.1 Purpose of fire management plans**

The purpose of a fire management plan is to describe the preferred wildland fire management direction in a defined area to achieve specific resource management objectives and outcomes while ensuring the protection of life, assets and resources.

A fire management plan for a provincial park or conservation reserve is a type of secondary plan. Secondary plans may be considered at the discretion of the provincial park or conservation reserve manager in particularly complex situations when additional planning is warranted.

#### **Text Box 3 – Secondary plan**

Plans that may be prepared, generally for complex topics, where approved management direction does not provide sufficient direction to address a certain topic. Secondary plans are treated as amendments to management direction (OMNR 2014b).

Preparation of a fire management plan should be considered if:

- More detailed planning is needed to develop specific resource management goals, objectives and outcomes to be achieved through wildland fire response and prescribed burning;
- There are many significant vegetation communities present that require a particular type of fire for renewal or maintenance (e.g., surface fires necessary to renew red pine and white pine stands);
- The significance, number or arrangement of assets and resources warrants more detailed planning and/or extensive wildland fire mitigation to minimize the risk of detrimental effects from fire;
- A complex landscape scale prescribed burning program is planned, involving repeated burns of multiple locations over several areas and over an extended period of time;
- Indigenous communities are interested in collaborative fire management planning.

### **4.2 Preparing a fire management plan**

This section provides guidance on the standards, content and suggested resources for preparing a fire management plan. Steps for preparing a fire management plan generally include:

1. Identify the planning area

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2. Compile and analyse information
3. Establish goals and objectives
4. Develop tactics and outcomes
5. Assess wildland fire management options
6. Identify compartments and assign fire levels
7. Identify how the plan will be monitored

A fire management plan template is available that provides a suggested format and additional guidance for documenting: background information and analysis; goals, objectives, tactics and outcomes, and; the preferred wildland fire management direction for a provincial park or conservation reserve or a group of areas. Refer to **Section 2** for guidance on establishing a planning team, the planning process and consultation and engagement requirements.

#### ***4.2.1 Identify the planning area***

Fire management plans may apply to one or more provincial parks and conservation reserves and other Crown lands (e.g., enhanced management areas, forest reserves). The plan may address all or portions of these lands (e.g., islands and peninsulas). Furthermore, these areas may be dispersed over large geographic areas with intervening Crown or other lands (private, federal) that are not covered by the plan. For these reasons, it is important that the geographic extent of the plan area is clearly identified and excluded lands are noted. The plan should also describe the administrative context for the planning area, including MNRF region and district, Ontario Parks zone, and treaty area.

#### ***4.2.2 Compile and analyse information***

This step is focused on compiling and integrating data and information necessary to understand the interaction of fire with the landscape and assessing risks to assets and resources. This provides the basis for developing goals and objectives of the plan and informs the assessment of wildland fire management options. Information and analysis generally relate to describing the landscape, assessing the fire regime, and identifying and assessing assets and resources.

#### ***Describing the landscape***

Knowledge of the biological and physiographic characteristics of the planning area is necessary to understand the ecological role of fire in the provincial park or conservation reserve. The current and projected interaction of climate, landforms, topography and vegetation influences fire behaviour and effects. In addition, knowledge of landscape

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features (e.g., location of waterbodies that could serve to prevent the spread of fire) assists with delineating fire compartments, as described in **Section 5.2.2**. These characteristics of the planning area should be described in the plan. The level of detail and analyses will vary depending on the planning area and the purpose for preparing the fire management plan, as well as the availability of data and information.

Much of this information can be found in provincial park or conservation reserve management plans, secondary plans, life and earth science inventories and check sheets, or derived from spatial data such as land cover mapping.

#### ***Assessing the fire regime***

One of the key steps in fire management planning is to investigate the fire regime of the specific area or the region. Investigating the fire regime is important for:

- Providing a baseline for evaluating changes in the fire regime (e.g., due to climate change or allowing fire);
- Informing the development of objectives relative to maintaining or restoring ecological integrity;
- Assisting in determining the level of fire required to restore fire disturbance processes and landscape patterns.

The fire regime varies across the province depending on the interaction of climate, landforms and vegetation (Van Sleetuwen 2006). There are many methods, resources, and tools available to assist in characterizing the fire regime. Fire regimes are typically assessed at landscape scales (e.g., ecoregion). The level of analysis to assess the fire regime should be balanced with available resources and the level of certainty needed for selecting appropriate and achievable objectives. For examples of resources for investigating the fire regime refer to Appendix 2.

#### ***Changes in the fire regime***

The planning team should consider the fire regime that created the ecosystem and impacts of previous activities in the study area (e.g., settlement, land clearing, railways). Information should be gathered on recent fire history (available through the provincial fire archives) and detailed fire history studies.

Projected changes in the fire regime due to climate change should also be assessed. In general, the number and severity of fires is expected to increase in the province over the next century, with the greatest changes projected to occur mid-century and beyond (Wotton et al. 2005).

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### *Ecological impacts*

A history of fire exclusion may have altered ecosystems compared to a natural fire regime. Understanding these ecological impacts will assist in setting objectives and outcomes to restore ecosystems through wildland fire management, and the appropriate tactics to achieve them.

Any impacts that fire exclusion has had on the fire regime should be documented in the plan. Include a description of any species and age-class shifts and/or fuel accumulations in featured fire-dependent communities relative to changes in the fire regime.

Things to consider in investigating how the provincial park or conservation reserve has been affected by changes to the fire regime include:

- Is there written, oral or other evidence indicating that Indigenous people traditionally used fire?
- Is an observed increase in the number of fires due to more ignitions or is it an artefact of better/more intensive fire detection?
- Are vegetation community changes due to fire exclusion or a natural variability in fire regime?
- Are there changes from the desired forest/ecosystem condition?
  - Is the forest composition and structure, and landscape patterns, of the provincial park or conservation reserve within the range of natural variation? (e.g., Jackson 2017)
  - Has fire exclusion influenced insect, disease, weather damage, outside the bounds of natural variation?
- How have past forest management practices influenced forest composition?
  - How can fire management be used to manage the forest condition?
  - Are there other vegetation management tools that should be considered?
- Are ecosystems of the park or reserve, or portions of an ecosystem, in need of active restoration work?

Models, used in combination with other sources of information, may be a useful tool for assessing some of the effects of fire exclusion. Models may provide an estimate of the range of variation of specific parameters to be expected under a natural fire regime, which can then be compared with the current forest condition. For example, models used in forest management planning, such as the Boreal Forest Landscape Dynamic Simulator (BFOLDS), State-and-Transition Simulation Model (ST Sim) and Ontario's

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Landscape Tool (OLT) (e.g., OMNR 2010 and 2014f, OMNRF 2018e) may assist with evaluating the effects of fire exclusion on forest composition, structure and vegetation patterns. As with all models, be aware of the assumptions, limitations and data inputs to evaluate if they are an appropriate tool for assessment.

Planning teams should also consider how climate change and associated effects on the fire regime will affect future forest conditions. Models and information about projected changes to vegetation and fire disturbance are sources of information for assessing ecological impacts and identifying adaptation strategies (Appendix 2). These kinds of analyses can support the development of goals, objectives and wildland fire management tactics to reduce the impacts of climate change and promote ecosystem resilience (see **Figure 2**).

#### ***Identifying and assessing assets and resources***

The process of identifying and assessing assets and resources is the same for a fire management plan as for the preparation of an assets, resources and opportunities map (see **Section 5.2.1**).

An assessment of fuels (e.g., wildland vegetation materials that can burn) may be completed to provide additional information for assessing the risk to assets and resources and informing fire management options. The term “fuels” usually refers to aboveground living and dead surface vegetation but may also include roots and organic soils, such as peat. The type, quantity, size, arrangement and distribution of fuels are factors that affect fire behaviour, including ease of ignition, rates of spread and fire type. A fuels assessment evaluates the interaction of these factors with fire weather indices, topography, and natural and anthropogenic fuel breaks.

The location of assets and resources relative to the fuel type (e.g., type of vegetation) can be used to assess risks of problematic fire control at different times of the year. The effects of climate change on fuel types should also be considered to help assess how the risk to assets and resources may change in the future (Wotton et al. 2005).

Prevention and mitigation measures should be considered to reduce the risk to assets and resources from problematic fire control (e.g., FireSmart planning, public education). These measures should be identified in the plan as tactics and considered when establishing compartments and fire levels.

Sources of information to assist with identifying fuels include provincial forest fuels inventory, forest resource inventories (FRI), ground surveys and aerial imagery.

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Standard Canadian Forest Fire Behaviour Prediction System (FBP) fuel types can be derived from these sources.

#### ***4.2.3 Establish goals and objectives***

Goals and objectives establish the intent of the fire management plan and provide the basis for identifying desired outcomes for fire response and operations, and the need for prescribed burning. In general, the goal of fire management should be to shift ecosystems towards a structure, composition and function that support the maintenance or restoration of ecological integrity.

Setting clear, measurable objectives is necessary for defining outcomes, developing tactics to achieve those outcomes, and assessing their effectiveness based on monitoring and new information. Objectives should be S.M.A.R.T. (specific, measurable, achievable, realistic and timely) and clearly linked to the goal. Refer to the Fire Management Policy for Provincial Parks and Conservation Reserves when establishing goals and objectives.

Factors to consider when developing goals and objectives include:

- The goals, objectives and site-specific policies established for the provincial park or conservation reserve;
- Characteristics of the planning area and broader landscape context;
- Assets and resources of the park or reserve;
- Fuels assessment (if one has been completed), and;
- Opportunities for ecological benefits of fire.

Climate change is another factor that should be considered in setting goals and objectives. Consider the projected changes to the climate within the term of the plan and how this could affect the achievement of the objectives (e.g., McDermid et al. 2015). Climate smart goals and objectives are flexible and achievable across a range of potential climates (OMNRF 2018b). For example, restoring a natural or historic fire regime may not be feasible under current or future climate conditions. An alternative approach could focus on the use of fire to achieve ecological benefits, recognizing that changing conditions may preclude restoration of a historical reference condition (Parks Canada and the Canadian Parks Council 2008, Parrish et al. 2003).

#### ***4.2.4 Develop tactics and outcomes***

Tactics are identified for achieving each objective and include a relative timeframe for completion. Outcomes identified for each tactic should state the desired result.



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Outcomes establish the benchmarks for measuring achievement of objectives and should be developed in conjunction with identifying indicators for monitoring. To the extent possible, identify quantifiable outcomes that relate to the objective, such as hectares of forest burned or restored. Quantified outcomes, however, should have a sound ecological or operational basis that is explained in the plan. If there is inadequate information or analysis to quantify outcomes, then a qualitative statement is preferred (e.g., an increase or decrease in a particular forest type or age class).

### **4.2.5 Assess fire management options**

Fire management options include response to wildland fire, prescribed burning or a combination of these approaches. Wildland fire response options may range from limiting the area burned in some areas, allowing a wildland fire, or prescribing the conditions under which a fire would be allowed to burn to achieve a defined objective (see **Table 2**). Prescribed burning may be used to reintroduce fire disturbance where opportunities for wildland fire are limited but specific management objectives are best achieved with fire.

Each fire management option should be evaluated to determine the most feasible and effective strategy for achieving the goals and objectives of the fire management plan. Generally, a combination of fire management approaches will be applied to different parts of the planning area to best achieve the objectives of the plan while protecting assets and resources and managing social disruption.

Assessing fire management options and refining objectives is an iterative process. For example, if a fire management option is determined to be unfeasible it may be necessary to revise an objective so that it is achievable based on available options.

Consider the following when evaluating each fire management option:

- Will the fire management option achieve all or part of one or more objectives? Are there any conflicts with objectives?
- Are there priority areas where wildland fire or prescribed burning is the optimal or only option for achieving the objectives?
- Are there areas where risk of fire escape is unacceptable if wildland fire is allowed or prescribed burning is undertaken?
- What are the potential current and future environmental effects of the fire management options and can negative impacts be mitigated?

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- What are the risks to assets and resources of applying certain wildland fire response options or prescribed burning? Can risks be mitigated?

**Table 2. Examples of objectives, tactics and outcomes**

Objective 1: *Renew declining older forest stands and areas succeeding to shade tolerant species by allowing wildland fire and using prescribed burning.*

#	Tactic	Outcome	Relative Priority	Relative Timeframe*
2.1	<i>Identify and prioritize old growth forest communities where wildland fire is allowed</i>	<i>Increase in area of young forest in areas with natural fire disturbance Reduction in area of shade tolerant species</i>	<i>Critical</i>	<i>Long-term</i>
2.2	<i>Use prescribed burning to regenerate red and white pine stands and retain old growth forest structure</i>	<i>Renewal of old growth red and white pine forest</i>	<i>Critical</i>	<i>Ongoing</i>

Objective 2: *Limit wildland fire to protect human life and infrastructure.*

#	Tactic	Outcome	Relative Priority	Relative Timeframe*
1.2	<i>Prioritize assets and resources x, y, z for protection from wildland fire during escalated fire activity</i>	<i>No loss of assets and resources x, y, z due to wildland fire</i>	<i>Critical</i>	<i>Ongoing</i>
1.5	<i>Implement FireSmart around buildings within the park/conservation reserve</i>	<i>FireSmart planning implemented for 10 buildings</i>	<i>Necessary</i>	<i>Short-term</i>
1.6	<i>Encourage FireSmart actions to protect private infrastructure</i>	<i>Information on FireSmart distributed to neighbouring municipalities</i>	<i>Beneficial</i>	<i>Ongoing</i>

\* Timeframes: short-term=complete within 5 years; long-term= complete in >5 years; ongoing=actions that recur

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Document the fire management options and preferred approach in the plan. Outline how the planning team arrived at the preferred option, particularly if there was any debate about the ability to mitigate any of the risks.

Include priority and timeframe for each outcome to guide implementation and monitoring. A table can be useful to organize this information (see **Table 3**).

#### ***4.2.6 Identify compartments and assign fire levels***

Once fire management options have been assessed, fire compartments and fire levels can be identified by completing the assets, resources, and opportunities map (**Section 5.2.2**).

Fire probability and fire growth models can be used to assist in defining compartments by modelling fire spread under various fuel and weather conditions. Application of such models usually requires specialized expertise that should be considered in establishing the planning team.

Ideally, fire containment features that are secure and easily distinguishable from the air and ground (e.g., roads, lakes, landforms) should form the compartment boundaries. Where these are not available, adjoining less fire prone fuels (e.g., deciduous dominated stands, rock outcrops, swamps, etc.) can form defensible boundaries. In addition, prescribed burns and other fuel management techniques can be used at strategic locations to impede fire spread thereby strengthening compartment boundaries.

Modelling and creating or strengthening firebreaks should be a prerequisite to fire management approaches that have a higher level of risk, such as allowing more intense fires to achieve an ecological objective.

Provide a summary of the objective for each compartment and the associated fire management direction in the plan.

#### ***4.2.7 Identify how the plan will be monitored***

Fire management plans should include a description of how the outcomes of fire management will be monitored and the effectiveness of actions evaluated. **Section 7** provides guidance on monitoring and reporting to assess implementation of the plan.

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## **5.0 ASSETS, RESOURCES AND OPPORTUNITIES MAPS**

### **5.1 Purpose of assets, resources and opportunities maps**

Assets, resources and opportunities maps are used to spatially identify areas that could benefit from wildland fire and those that may be adversely affected. These maps provide additional operational details for implementing the fire management direction in management plans. Identification of assets, resources and opportunities prior to a wildland fire situation helps to expedite decision-making and prioritize response actions by AFFES.

### **5.2 Preparing an assets, resources and opportunities map**

The following sections are intended to guide staff through a process of confirming known assets and resources on the landscape, identifying opportunities for achieving the ecological and resource management benefits of wildland fire, and setting priorities that will inform appropriate wildland fire response.

The general steps in preparing an assets, resources and opportunities map include:

1. Identify and assess assets and resources
2. Identify compartments and the preferred fire management approach. (i.e., fire level)
3. Prepare supplementary information

#### ***5.2.1 Identify and assess assets and resources***

To ensure that AFFES has the information needed to support making appropriate wildland fire management decisions it is important to identify the assets and resources that are within the provincial park or conservation reserve. “Assets” are any built thing that has ecological, cultural, recreational or socio-economic value. “Resources” are natural attributes or features that are values of a provincial park or conservation reserve. Resources may be of ecological, cultural, recreational or socio-economic value.

Information and data about assets and resources is available from a variety of sources. Many information sources used for management planning are also relevant for identifying assets and resources. Refer to the Guideline to Management Planning for Protected Areas in the Context of Ecological Integrity (2014d) for a list of information sources and examples.

Much of the same information and data sources will be used for mapping assets and resources among different areas, particularly those within the same geographic region. Consider grouping areas to expedite data preparation and improve the efficiency of the

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mapping process. Grouping may be done at different scales, such as a park cluster, ecodistrict or ecoregion. Grouping should also be considered for provincial parks and conservation reserves with assets and resources that would benefit from a landscape-level assessment (e.g., old growth forest).

All data and information should be assessed for its quality, currency and relevance for preparing the assets, resources and opportunities map. Consider why, when and how the information was collected and at what scale.

Once all the sources of data and information have been identified, the next step is to compile it into a single location. This is best accomplished through GIS. Combining all data sources into GIS will allow the planning team and local knowledge holders to manipulate information, recognize inter-relationships between assets and resources, and assist with confirming if the information is complete and accurate. Remote imagery may be useful to assist with confirming features and identifying missing data.

It is important to ensure that complete and up to date information is available to AFFES. If information is missing or incorrect, the data repository should be updated following the procedures of the data custodian. As much as possible, local and regional geospatial information should be made available in centralized, provincial data stores such as Lands Information Ontario (LIO), where it is accessible to both AFFES and Ontario Parks staff for use in assessing wildland fires and making decisions on the appropriate response.

The planning team will need to assess assets and resources either individually or as a group for potential effects of wildland fire and identify if impacts would be positive, negative or neutral. In some cases, a certain type of fire may have positive impacts but there would be an undesirable impact if a different type of fire and corresponding effects were to occur. For example, an old growth forest that has been identified as a significant value would be sustained by a surface fire but may succeed to a different community if there was a crown fire. These situations and the type of beneficial fire should be noted during assessments. Results of assessments may be summarized in an appendix to the map (see **Section 5.2.3**).

While many assets and resources can be assessed at a site-specific scale, some will need to be assessed in a broader landscape context. For example, assessing the effects of wildland fire on forest composition will require analysis at a scale larger than the provincial park or conservation reserve (e.g., ecodistrict, ecoregion, forest

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management unit). These assessments will provide important landscape context at broader scales, such as connectivity.

Opportunities for wildland fire will begin to emerge through insights into the assessment of assets and resources. The response of assets and resources to wildland fire and their distribution throughout the provincial park or conservation reserve will start to suggest areas where fire could be used to achieve beneficial effects. Take note of aggregations of assets and resources that would be negatively affected by fire and areas where they are widely dispersed. Also notice the location of assets and resources that would benefit from fire in relation to those that would be adversely affected. These observations will inform the identification of compartments and assignment of fire levels in the next step.

Note that information on some assets and resources is considered sensitive. Information identified as sensitive by Indigenous communities must be treated as confidential under the Freedom of Information and Protection of Privacy Act (OMNRF 2018a). The location of sensitive species, plant communities and wildlife concentration areas should be protected in accordance with the Sensitive Data Location Standards provided by the Natural Heritage Information Centre (OMNRF 2018c).

### ***5.2.2 Identify compartments and assign fire levels***

Fire compartments can be identified once all assets and resources have been identified and assessed. Areas with a high density of assets and resources that could be negatively affected by fire will make up one or more compartments depending mainly on geographical separation. The remaining area may have one or more compartments which have opportunities for wildland fire. “Opportunities” are areas where it is possible to use fire to achieve a management objective. These are characterized by identifying fire compartments and assigning fire levels which allow for use of fire.

Each fire compartment is then assigned the appropriate fire level to indicate the preferred fire management approach. There are three fire levels that can be assigned to a compartment: “Limit Fire”, “Allow Fire” and “Prescribe Fire” (**Table 3**). The appropriate fire level is determined based on consideration of the assets and resources that are present within the compartment, the risk of adverse impacts, and the potential for ecological or other benefits. The assets, resources and opportunities map will include at least one of the three levels of fire for all terrestrial areas in the provincial park or conservation reserve.

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### ***Description of fire levels***

#### ***“Limit Fire”***

“Limit Fire” should be used in areas where there is a high risk of adverse impacts from a wildland fire. Areas will generally consist of populated areas and concentrated groupings of assets and resources which may be damaged by wildland fire. Other considerations in designating “Limit Fire” compartments include cost to replace potential losses, ecological impacts, climate considerations (potential increase in fire severity/frequency in future), and public and stakeholder concerns.

The inherent risks of wildland fire may lead staff towards designating “Limit Fire” as a means of risk aversion; however, excluding fire comes with its own hazards. The loss of the natural process of fire can unnaturally build-up forest fuels in some forest types, which can result in more intense wildland fires that can’t be contained by suppression and that could ultimately cause greater losses than the potential risks of allowing wildland fire. Increases in wildland fire frequency and severity as a result of climate change are expected to exacerbate these risks. In some areas, actions to mitigate the negative impacts of fire (see **Section 3.2.2**) may lead to assigning “Allow Fire” or “Prescribe Fire” to the compartment in the future.

#### ***“Allow Fire”***

Areas where wildland fire would be beneficial and that have few or no assets and resources that could be adversely affected should be classified as “Allow Fire”. The priority in these compartments is to allow wildland fire to act as a natural disturbance and contribute to maintaining or restoring ecological integrity, while fire protection is applied to identified assets and resources that could be negatively affected.

#### ***“Prescribe Fire”***

Previously, the application of prescribed fire required the preparation of a fire management plan. “Prescribe Fire” compartments may now be used in limited, non-complex situations where comprehensive planning is not warranted. Prescribed fire is a type of wildland fire that is deliberately utilized in a predetermined area in accordance with a prespecified and approved burning prescription to achieve pre-set management objectives. Objectives may be related to achieving ecological benefits or reducing potential hazards and risks to assets and resources. Fires that occur outside of prescription would be expected to have negative outcomes relative to the management objective. “Prescribe Fire” compartments may also be suitable for areas identified for

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prescribed burning in a management plan for the provincial park or conservation reserve, prescribed burn plan or fire management plan.

The management objective and type of fire must be identified for “Prescribe Fire” compartments in consultation with AFFES. Sufficient information should be included in an appendix to the map for AFFES to prepare the prescription that will achieve the objective for the compartment. Fire prescriptions must be developed by AFFES and approved by the appropriate AFFES manager.

Preparation of a fire management plan should be considered for complex situations with many “Prescribe Fire” compartments or if the objectives for the compartment(s) are not supported by the management plan for the provincial park or conservation reserve.

**Table 3. Description of fire levels**

<b>Fire Level</b>	<b>Preferred Approach</b>	<b>Description</b>
Limit Fire	Limit the area of wildland fire disturbance	<ul style="list-style-type: none"> <li>• Areas where wildland fire would have a negative impact on assets and resources</li> <li>• Moderate to high density of assets and resources are present that could be negatively affected by fire</li> <li>• Areas where fire would increase the likelihood of threat to human health and safety</li> </ul>
Allow Fire	Allow wildland fire disturbance	<ul style="list-style-type: none"> <li>• Areas where fire would be beneficial</li> <li>• Few assets or resources are present that would be negatively affected by fire</li> </ul>
Prescribe Fire	Allow a specific type and intensity of wildland fire to achieve a defined objective	<ul style="list-style-type: none"> <li>• Areas with specific management objectives that can be achieved through application of prescribed fire</li> <li>• Fires outside of prescription are expected to have negative outcomes</li> </ul>

#### ***Assigning fire levels to compartments***

The vision, objectives, fire management direction and other site-specific policies of the management plan for the provincial park or conservation reserve should be reviewed to help guide the identification of fire compartments and the appropriate fire level. Climate change adaptation or mitigation strategies identified in the management direction should



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also be considered (see **Section 3.2.3**). In some cases, an amendment may be needed to align preferred fire levels and management direction (see **Section 8.1**).

In addition, consider readily available information on the regional fire regime and vegetation communities of the provincial park or conservation reserve and broader landscape. This information will assist with understanding the ecological role of fire in the park or reserve (e.g., Van Sleetuwen 2006). See **Section 4.2.2** and **Appendix 2** for further information on assessing the fire regime.

Park zoning may also assist with delineating compartments and assigning a fire level. For example, the location of access and development zones in parks could help guide the delineation of “Limit Fire” compartments. Similarly, natural environment and wilderness zones may be good candidates for “Allow Fire” compartments. Although zoning is a consideration, it is not a determining factor in delineating compartments and the fire level. To the extent possible, the boundary of compartments should follow features such as waterbodies, landforms and roads that can provide fuel breaks and help to contain a fire.

AFFES will manage fires to best meet expectations of all land managers. Although external assets and resources are considered by AFFES in determining the appropriate response to a wildland fire, the purpose of the assets, resources and opportunities map is to communicate the preferred fire management approach and preferred outcomes of wildland fire management direction for the provincial park or conservation reserve.

Decisions about the appropriate response to a wildland fire may vary from the assets, resources and opportunities map depending on risk and conditions at the time of a fire. In addition, the uncertainty of a wildland fire occurring in an “Allow Fire” or “Prescribe Fire” compartment may be unacceptable relative to the management objective timeframe. For these reasons, consider priorities for prescribed burning when completing the assets, resources and opportunities map. Prescribed burning may be used in any compartment regardless of the fire level, including “Limit Fire”.

#### ***Sensitive sites***

Sensitive sites are areas where fire response operations have the potential to cause adverse impacts (OMNR 2007). Examples of sensitive sites include areas prone to erosion or with shallow soils, wetlands and waterways, the habitat of some species at risk, and cultural heritage resources. Sensitive sites may be identified on the assets, resources and opportunities map, or on a separate map and not displayed in AFFES Mapper if the information is confidential.

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AFFES follows provincial policy and guidelines to minimize environmental damage from the use of heavy equipment, the construction of fire lines, and use of foam (OMNR 2007, 2011, OMNRF 2018d). Identifying sensitive sites in advance of a wildland fire will alert AFFES to the need to work with local Ontario Parks staff to mitigate adverse impacts of fire response operations in these areas.

#### ***5.2.3 Prepare supplementary information***

An appendix must be prepared for all assets, resources and opportunities maps that include “Prescribe Fire” compartments. For each “Prescribe Fire” compartment, identify the management objective and the fire prescription.

Supplementary information about sensitive sites should also be provided in an appendix. Describe the value that is sensitive at each site within all compartments. Mitigation measures to avoid or minimize impacts may also be included; however, the specific operational decisions will be determined based on the circumstances at the time of a fire.

Additional details on assets and resources may also be documented in one or more appendices to the map.

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#### **6.0 IMPLEMENTATION**

Assets, resources and opportunities maps and fire management plans should be approved by the appropriate Ontario Parks managers and AFFES managers well in advance of the fire season. AFFES may identify an annual deadline for submissions to allow adequate time for approval and administration.

A copy of the map and appendices should be submitted to AFFES and posted in an appropriate Ontario Parks information management system. Fire management plans and accompanying assets, resources and opportunities maps are also submitted to AFFES and posted in an appropriate Ontario Parks information management system.

AFFES will use information from the map and the fire management plan if applicable to help determine the appropriate response to wildland fires in the provincial park or conservation reserve. Conditions at the time of fire, or identification of previously unknown assets or resources, may preclude implementation of fire management direction. During fire response, all assets and resources will be documented by AFFES in an Initial Attack Scouting Report and a Fire Assessment Report, and appropriate action will be taken to protect the identified assets and resources, including those that are newly discovered.

Annual preparedness planning should be conducted by Ontario Parks and AFFES staff. The purpose of preparedness planning is to review protocols, update any operational, communications or emergency response plans, and identify specific roles, responsibilities and contact information.

If there is no specific direction on wildland fire response (e.g., there is no assets, resources and opportunities map), fire operations will be carried out in accordance with the Wildland Fire Management Strategy. Ontario Parks and AFFES managers shall continue to work to identify assets and resources requiring protection and set the preferred fire management approach that will allow appropriate fire use on the landscape.

Annual prescribed burn planning and operations must be conducted in accordance with provincial policies and protocols (OMNR 2008a, 2008b).

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## **7.0 MONITORING AND REPORTING**

Monitoring is an essential part of adaptive management. Evaluating the effectiveness of actions in relation to associated objectives provides essential information to adjust management prescriptions, tactics and outcomes if objectives are not being achieved. Even in the absence of activity, monitoring is essential. For example, an insect outbreak could lead to review of the assigned fire level due to changes in the potential fire behaviour and fire effects.

### **7.1 Monitoring**

Monitoring should be planned and conducted to assess progress towards achieving objectives and outcomes and to evaluate if mitigation measures were successful. In a fire management plan, clear and measurable objectives and outcomes are necessary to identify what needs to be monitored and to select the appropriate indicators at a suitable scale. For example, objectives and outcomes identified in collaboration with Indigenous communities may require monitoring of impacts to cultural assets and resources at a local scale. In contrast, differences between actual and projected changes to the fire regime due to climate change or other factors would be assessed at a landscape scale. Such assessments would assist with determining the need for adjustments in the fire management direction to achieve desired outcomes. Other requirements for project monitoring, evaluation and reporting should also be addressed, as applicable.

Suitable monitoring timeframes and intervals should also be considered. Collection and analysis of data is dependent on the temporal scale for detecting a response in a variable, how frequently the data used in analysis is updated, and reporting timelines.

Monitoring should be coordinated across geographic areas and programs where possible. Coordination is especially important for landscape scale monitoring and analysis and is more effective than one-off initiatives. This may require the identification of common indicators when defining objectives. Select indicators that align with and complement existing programs to realize efficiencies in data collection and analysis.

Other program areas may already collect data that could be used to assess the effectiveness of fire management activities or monitor the actions taken:

- AFFES collects information on every reported fire, including the location of the fire, date, area burned, fuel type, duration of the fire, and description and location of suppression activity;

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- Several programs have permanent sampling plots with existing data sets that could be used as a baseline for assessing effects following a fire (e.g., Forest Resources Inventory (FRI), Ontario Parks Information and Monitoring Program (OPIAM));
- Zone ecologists, park superintendents or conservation reserve managers may have records of research conducted in specific provincial parks or conservation reserves that would support fire effects monitoring.

Data management is an important consideration. Ontario Parks has different applications for managing and storing data, such as OPIAM for monitoring and inventory data, and the Protected Areas Planning Information Repository (PAPIR) for documents related to planning. Other corporate applications such as LIO also may be relevant.

#### **7.2 Reporting**

The frequency and methods for reporting are dependent on the variables being measured and how the information will be used. For example, information on fire events, response and prescribed burning activity is important for the annual review of assets, resources and opportunities maps. Existing internal reporting mechanisms, such as fire assessment reports and post burn reports for prescribed burning, may be sufficient to assist with these reviews.

Reporting on the effectiveness of fire management at achieving specified objectives is included in examination reports and used to inform further planning needs.

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### 8.0 REVIEW AND AMENDMENT

Appropriate response to wildland fire is best supported with up to date direction that is responsive to changing conditions and new information. Monitoring fire management outcomes and amending direction as appropriate helps achieve this goal.

#### 8.1 Management direction for provincial parks and conservation reserves

Many management plans will not identify progressive wildland fire response options because of limitations in former policies, and variability in the scope and level of detail in older documents. For example, many management plans formally known as interim management statements and statements of conservation interest reflect broad provincial policy but do not identify site-specific policies. In some cases, there is no direction on fire management.

Despite this, there is no immediate need to adjust management plans to align with the fire management policy, this guideline or the Wildland Fire Management Strategy. Administrative changes to fire management direction will be identified during the examination process.

The need for adjustments should be considered during the preparation of assets, resources and opportunities maps. Maps must reflect the fire management direction in management plans. **Figure 3** summarizes considerations for assessing if adjustments to fire management direction are needed when preparing an assets, resources and opportunities map.

An adjustment to management direction is not necessary if site-specific policies for fire management are supportive of the fire response options being contemplated for the mapping. Some examples of fire management direction that supports allowing wildland fire include:

- suppression of human-caused fires but natural fires may be allowed to burn
- intent to prepare a fire response or management plan

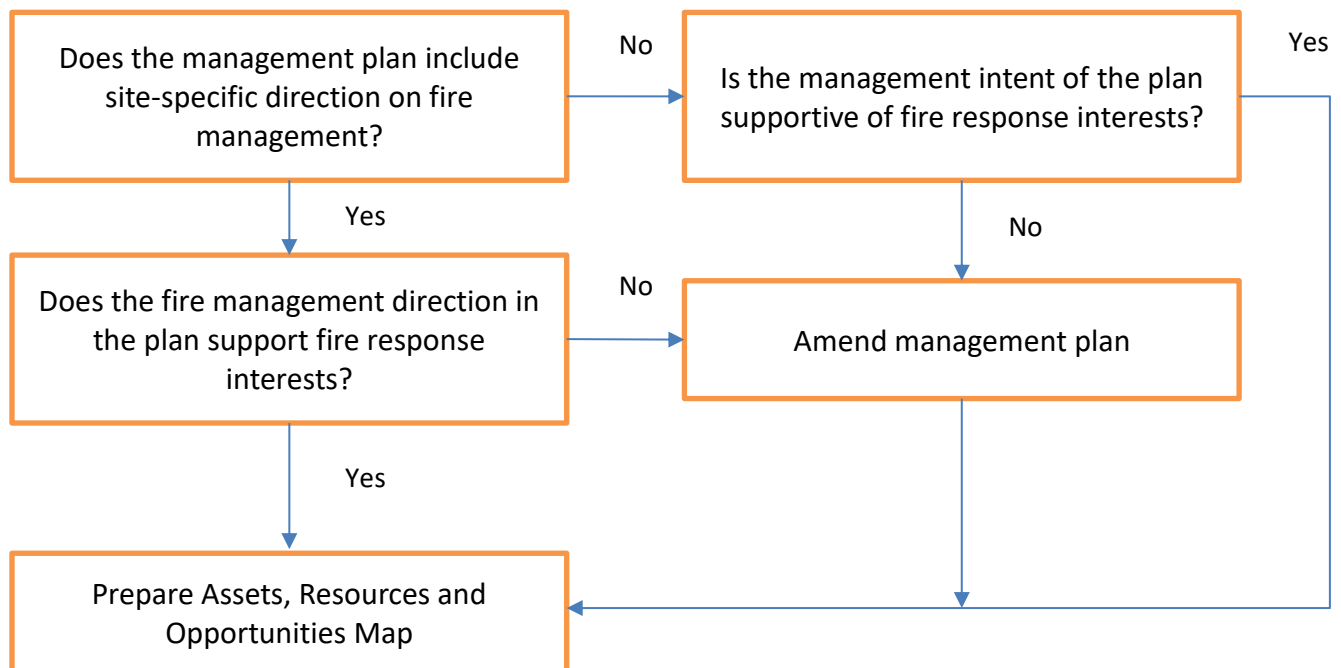
Where site-specific policies do not exist, or there is no fire management direction, plans should be reviewed to determine if management interests reasonably support fire response interests. In this case, management intent for the provincial park or conservation reserve may be adequate to direct the identification of wildland fire opportunities. For example, if the vision or goal, objectives or broad management statements describe intent to manage for a natural evolving succession, the opportunity to allow wildland fire may be available if fire is natural to the area.

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Similarly, the interest in carrying out a prescribed burning project that is not identified in a management plan does not trigger an amendment if the project aligns with management intent (e.g., there is direction on recovering habitat or managing invasive species where prescribed burning would be an effective management approach).

Amendments to management direction will likely be necessary to support assets, resources and opportunities mapping where interests in fire response has changed, and preferred fire levels are contrary to direction in the management plan, particularly where the direction is explicit and was established through planning.

Following approval of a fire management plan, direction in the parent management plan for the provincial park or conservation reserve is effectively amended and therefore adjustments should not be necessary.



**Figure 3. Considering fire management direction when assessing preferred fire levels for assets, resources and opportunities maps.**

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**8.2 Fire management plans**

Fire management plans are examined along with the parent management plan. They can be reviewed earlier if needed and updated or amended to include new information and monitoring outcomes. The purpose of the review is to evaluate if objectives and outcomes are being achieved, assess how tactics have been implemented, and determine whether adjustments to fire management direction are needed.

Examinations and amendments to fire management plans are subject to the same requirements as management plans. Refer to Ontario's Protected Areas Planning Manual and Guidelines (OMNR 2014b).

Despite the process and timelines for examinations, assets, resources and opportunities maps prepared as part of a fire management plan should be updated annually if needed.

**8.3 Assets, resources and opportunities maps**

As part of annual preparedness planning, assets, resources and opportunities maps should be updated as needed. Updates may be required if there is new information about assets, resources or opportunities, or the fire level or compartments have been altered. For example, if a wildland fire was allowed to burn on an island and subsequent burns would have negative environmental impacts, the compartment may require adjusting, and fire level updated to 'Limit Fire' for a period of time.

A more fulsome review should be undertaken at 10-year intervals. The purpose of the review is to confirm that the assets, resources and opportunities map continues to be accurate, relevant, and consistent with the objectives and site-specific policies of the provincial park or conservation reserve, as well as with provincial policies for wildland fire management. Longer term monitoring, other new information, and examination outcomes should be considered during map review.



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### APPENDIX 1: POLICY FRAMEWORK

Several program areas have applicable legislation, policy, and operational responsibilities for fire management in provincial parks and conservation reserves. A summary of key direction is provided below. Staff involved in fire management planning should be familiar with these documents.

***Provincial Parks and Conservation Reserves Act, 2006 (PPCRA)***: Establishes the maintenance of ecological integrity, including ecological processes such as fire, as a primary principle in planning and management of provincial parks and conservation reserves.

***Wildland Fire Management Policy*** (OMNR 2016): Describes the principles, responsibilities, objectives, function and design of Ontario's Forest Fire Management Program.

***Wildland Fire Management Strategy*** (OMNR 2014a): The Strategy outlines the fire management program goals and objectives and commitment to public safety and minimizing unwanted loss and disruption as well as ensuring opportunities for fire to play its role in maintaining healthy ecosystems.

***Fire Management Policy for Provincial Parks and Conservation Reserves*** (MECP and OMNRF 2020 draft): Establishes an approach for informing appropriate response to wildland fire in provincial parks and conservation reserves and identifying opportunities for prescribed burning. The goal of fire management is to promote and encourage the use of fire as a natural ecological process for the maintenance and restoration of ecological integrity.

Additional documents that have been developed to provide more specific guidance for park and reserve planning, fire management and fire operations include:

***Ontario's Protected Areas Planning Manual and Guidelines*** (OMNR 2014b): Establishes a provincially consistent approach to the preparation of management plans for provincial parks and conservation reserves. Associated guidelines provide more detail on preparing management direction, Indigenous and public involvement, examinations and amendments.

***Prescribed Burning Operations Policy*** (OMNR 2008a): Establishes the requirements for the preparation of prescribed burn plans, in accordance with the *Prescribed Burn Manual* (OMNR 2008b).

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#### **APPENDIX 2: RESOURCES FOR PREPARING WILDLAND FIRE MANAGEMENT DIRECTION**

##### ***Fire Regime***

- Local studies of the fire regime (if available);
- Studies from adjacent areas (caution should be exercised in extrapolating research results from one area to another);
- Forest management plans for adjacent Sustainable Forest Licences (SFL) (documents age class shifts/gaps, successional trends, natural “depletions” due to insects and disease);
- Landscape modeling conducted for forest management planning to estimate the Simulated Range of Natural Variation for forest composition, stand age and landscape pattern and make comparisons with existing landscapes (e.g., OMNR 2010, OMNR 2014f, OMNRF 2018e);
- Forest management and fire ecology literature (e.g., Van Sleenwen 2006);
- Indigenous traditional knowledge of fire history, behaviour and ecology (e.g., Miller et al. 2008);
- Forest insect and disease survey reports; OMNR digital fire atlas (only includes records since the 1920s; dates of earliest records vary across the province);
- Historical and current FRI;
- LANDSAT imagery;
- Land surveys and other records that describe the historical forest condition and burned areas;
- Forest harvest histories (local history books, local knowledge);
- Studies of projected changes to the fire regime due to climate change (e.g., Wotton et al. 2005, Lemieux et al. 2007).

##### ***Climate Change***

- Climate Change and the Future Fire Environment in Ontario: Fire Occurrence and Fire Management Impacts (Wotton et al. 2005);
- Climate Change, Carbon Sequestration, and Forest Fire Protection in the Canadian Boreal Zone (Stocks and Ward, 2011);
- Climate change projections for Ontario: An updated synthesis for policymakers and planners (McDermid et al. 2015);
- Comparing Various Approaches for Estimating Fire Frequency: The Case of Quetico Provincial Park (Scoular et al. 2010);
- Current and projected future climatic conditions for ecoregions and selected natural heritage areas in Ontario (McKenney et al. 2010);

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- Forest Change adaptation tools – Tools and resources provided by Natural Resources Canada to support forest adaptation to climate change (<https://www.nrcan.gc.ca/forests/climate-change/tools-resources/17770>);
- Climate Insight: Guide to integrate climate adaptation into policy (OMNRF 2018b); Climate Change and Ontario’s Provincial Parks: Towards an Adaptation Strategy (Lemieux et al. 2007).