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# **Interim Guidelines – Fire and Fuel Management**

May 2013

## **GUIDELINES**

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- Members of the ABCFP Fire and Fuels Management Taskforce for identifying the need
- Members of the ABCFP Professional Practice Committee for recommending and following through
- Members: Bruce Blackwell, John Davies and Bruce Morrow for developing a 1<sup>st</sup> draft document to get us started
- Members who provided comments and suggestions

## Executive Summary

Wildfires in British Columbia (BC) are a widespread natural disturbance agent that has influenced forested ecosystems for thousands of years. Our management success in fire suppression has interrupted the frequency and severity of this important natural disturbance type, resulting in 1) increased incidence of forest health factors, 2) forest in-growth (increases in tree densities), and 3) forest encroachment (trees expanding into historic grasslands). These changes in forest condition are increasing forest fuel loads and contributing to larger and more severe wildfires. In addition: “There is strong evidence of a trend toward more severe and costly fires. This trend likely has many causes, including the direct and indirect effects of climate change as well as the encroachment of development into the forest...the more successfully we remove fire from the landscape, the more costly and damaging fires become.”<sup>1</sup> Important social, environmental, and economic values throughout BC can be, and are, negatively impacted by these serious fires.

Demonstrating a concern with associated issues, the Forest Practices Board has issued five reports in relation to fire and fuels management since 2006. A number of these reports include mention of forest professionals, professional reliance and the ABCFP, and its December 2008 report on Fire Hazard Assessment and Abatement specifically makes recommendation for the ABCFP to address issues relating to the fire hazard assessment process and best practices. Further to this recommendation, the ABCFP communicated with Wildfire Management Branch and licensees who have recently completed work on the process for fire hazard assessments. The ABCFP also established a taskforce in 2011 to identify the scope of fire and fuels management issues, to prioritize these issues and recommend actions for the top four. As a result of the taskforce outputs, the ABCFP is providing this professional guidance to its members.

Members of the Association of BC Forest Professionals play an integral role in the management of fire and fuels in BC forest ecosystems. Forest professionals are entrusted to ensure that practices applied to forest, forest lands, forest resources and forest ecosystems comply with legislative requirements, including the *Wildfire Act*, and that assessments, plans and prescriptions for fire and fuels management will meet the intended objectives. To properly manage fire and fuels, forest professionals are responsible for a broad area of practice including but not limited to: 1) fire hazard and/or abatement assessments, 2) fire management planning, 2) prescribed fire management plans or prescriptions, 4) Community Wildfire Protection Plans, 5) identification of Development Permit Areas, 6) advising on the development of bylaws and policy for local and provincial governments, FireSmart assessments, fuels management, ecological restoration, smoke management, and fire suppression

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<sup>1</sup> Forest Practices Board Report – SIR34 – Feb 2012 – Fire Management Planning

planning (incorporating modified response), and 7) report preparation.

With the increasing costs and damages associated with greater severity and frequency of wildfires, come increasing liabilities. These liabilities include, but are not limited to: loss of life/property, loss of forest structure, suppression costs, administrative penalties, and professional practice liabilities. Forest professionals need to understand these liabilities in order to protect the public, their client or employer, themselves, and the profession. Forest professionals also need to understand their scope of practice, which is limited by the authority provided by the ABCFP and by the individual practitioner's level of competence. A forest professional who practises professional forestry outside of his or her individual scope of practice may be at greater risk for professional liabilities.

The intent of this document is to provide ABCFP members with information and guidance to be considered when they are working in the area of fire and fuels management. This information and guidance includes:

- Clarification regarding the use of common fire and fuels management terms and their definitions;
- A review of the respective roles and responsibilities for forest professionals and their clients or employers, and approving authorities;
- A discussion on professional liabilities in relation to work in the area of fire and fuels management;
- A review of due diligence considerations and practices;
- Identification of aspects of fire and fuels management which include the practice of professional forestry, with examples;
- Clarification on expected and required skill sets;
- Considerations when developing fire and fuels related plans and prescriptions;
- Considerations for other land uses and values - and other types of plans and prescriptions

# 1 Introduction

## 1.1 This Document

This interim guidance is intended to support forest professionals practising in the area of fire and fuels management. It is interim because, while the association considers it important that this type of guidance be made available for members as soon as possible, comments and feedback received from members on the first draft guidance document indicate that there is opportunity for refinement and improvement. After the 2013 fire season, this document is scheduled for further review and update and opportunity for member comments and suggestions will be offered again.

In accordance with its duty to serve and protect the public interest, the association commonly provides guidance for its members to consider in their professional practice. It is intended that this document will benefit ABCFP members having authority to practise in the area of fire and fuels management, and will thus contribute to the interests of the public in BC.

The practice of professional forestry in BC is within the authority of the ABCFP, or “the association”, through the *Foresters Act*; and many activities within the area of fire and fuels management are considered to be the “practice of professional forestry” as defined within that Act. Some of these fire and fuels management activities, where professional consideration applies, include the *Wildfire Act* (industrial activities), community/interface protection, smoke management as defined under the Open Burning and Smoke Control Regulation, and prescribed burning (for a variety of resource values and purposes including ecological restoration). This guidance document is not intended to be technical in nature, but rather to describe professional considerations for ABCFP members who work in this area of practice, such as:

- Clarification regarding the use of common fire and fuels management terms and their definitions;
- A review of the respective roles and responsibilities for forest professionals and their clients or employers, and approving authorities;
- A discussion on professional liabilities in relation to work in the area of fire and fuels management;
- A review of due diligence considerations and practices;
- Identification of aspects of fire and fuels management which include the practice of professional forestry, with examples;

- Clarification on expected and required skill sets;
- Considerations when developing fire and fuels related plans and prescriptions;
- Considerations for other land uses and values – and other types of plans and prescriptions

## 1.2 Background

The Fire and Fuel Management Task Force (FFMTF) was established in February 2011, at the direction of the Professional Practice Committee (PPC) of the ABCFP. The FFMTF was to identify the scope of specific professional practice and stewardship issues relating to fire and fuels management and then to prioritize those issues by importance and urgency and make recommendations for ABCFP action.

After a preliminary meeting of the FFMTF in April 2011, and further online meetings and conference calls, a draft report was delivered to the PPC in September 2011. The PPC completed its review of the FFMTF report and submitted its final report to the ABCFP in April 2012. That final report provided suggestions and recommendations from the PPC in regard to the top four priority issues, and the first recommendation was that member guidance, or standards, be provided. This document is intended to address that recommendation.

## 2 Roles and Responsibilities<sup>2</sup>

Roles and responsibilities for members depend on the organizational structure of the client or employer (licensee, provincial or local government, private company, member of the public), the role of the member in that structure, and the complexity of the fire management issue that is under review. To ensure roles and responsibilities are properly assigned and understood, clear lines of communication are required to provide clarity regarding the respective roles and responsibilities of employers/clients and forest professionals when completing fire and fuels management activities that relate to professional practice.

### 2.1 The Client

Fire and fuels management plans, prescriptions, and activities can be initiated by a wide range of clients, including but not limited to:

- Provincial Government
- Local Government (Municipality or Regional District)
- Union of BC Municipalities
- First Nations

<sup>2</sup> Section 2 has been adapted from Guidelines for Management of Risk in Professional Practice (APEGBC, 2012).

- Land Owner or Development Consultant
- Utility (oil and gas, electric, rail, and telecommunications)
- Private Company (licensee or other)

These types of organizations or individuals retain a forest professional to carry out any of the following: 1) fire hazard and/or abatement assessment, 2) fire management planning, 3) prescribed fire management plan or prescription, 4) Community Wildfire Protection Plans, 5) identification of Development Permit Areas, 6) advising on the development of bylaws and policy, FireSmart assessments, fuels management, ecological restoration, smoke management, fire suppression planning (incorporating modified response) and 7) report preparation.

Prior to any type of fire and fuels assignments, it is helpful and will likely reduce the cost of professional services if the client/employer is informed about project requirements and can provide the forest professional with:

- Locations of existing, proposed and anticipated values at risk on, and if required, beyond the property;
- In general terms, proposed and anticipated land use changes (for example logging) on, and if required, beyond the property;
- Information on historic fires, or potential hazards such as large fuel accumulations, unwanted human activities, equipment maintenance problems;
- Relevant background information (written or otherwise) related to the assessment and the existing and proposed land use activity/plan, including previous assessment reports (geotechnical, wildlife, archeological, arborist) conducted for the client or available to the client; and
- Unrestricted access to, and if required, beyond the property.

For work within local government jurisdiction, or associated with residential development, the following can be requested from the client/employer:

- Identification of areas of probable civic expansion or provision of official community plans so treatments can be targeted to areas less likely for civic expansion;
- Process and procedures of subdivision approvals, development permits, and building permits, as applicable;
- Legal description of the property, as registered with Land Titles and Survey



Authority, and a copy of the current land registration including covenants;

- For subdivisions, a copy of the existing survey plan of the property, or the need for a survey plan, and the location of the legal property boundary markers on the ground (this may require a British Columbia Land Surveyor); and a proposed subdivision plan;
- For construction, plans of existing buildings or structures, and location of the proposed construction on the ground; and proposed construction drawings or site plans, and exterior building materials;
- Notification should land use, site development or forest (e.g. changes to forest health) and site conditions change or vary from those described in the report;
- If they exist, obtain a copy of the approving jurisdiction's guidelines for carrying out fire and fuel hazard assessments and/or for preparing reports.
- Any related bylaws, land covenants, Species at Risk information, or other know legislated expectations (regional district, local government or provincial) or agreements
- Location of buried utilities; fire hydrants and other suppression resources; medical and emergency resources

## **2.2 Forest Professional**

The forest professional is responsible for carrying out the fire and fuels assignment and, if required, for providing recommendations to reduce the likelihood of fire and/or damages to values at risk.

Prior to carrying out any type of fire and fuels work the following should be completed and/or considered, depending on the scope of the work: 1) fire hazard and/or abatement assessment, 2) fire management plan, 3) prescribed fire management plan or prescription, 4) Community Wildfire Protection Plans, 5) identification of Development Permit Areas, 6) advising on the development of bylaws and policy, FireSmart assessments, fuels management, ecological restoration, smoke management, fire suppression planning (incorporating modified response) and 7) report preparation.

There are a variety of other assessments that may be required, including archaeological, riparian and danger tree, and the above list should not be considered all-encompassing.

The forest professional is expected to:

- Confirm that he/she has appropriate knowledge and experience to carry out the required fire and fuels associated tasks within the complexity of the fire environment and if not, involve required specialists;
- Be knowledgeable about the activities and/or developments that are proposed for the type of land use or assessment area, including but not limited to the fire probability, fuel types and loading, values at risk, development permit requirements, fire bylaws, and applicable legislation;
- Understand and consider the cost/benefit aspects of fuel management treatments – although fuel management treatments are intended to benefit the public, carrying out these treatments can be very expensive, usually requiring the allocation of limited tax dollars away from other public needs;
- Comply with the requirements of the ABCFP (applicable policies/bylaws); and
- Consider the need for professional liability insurance (See Section 4 for more details).

When conducting fire and fuels related work the forest professional is responsible to:

- If necessary, assist the client in obtaining relevant information, such as listed in Section 3.1;
- Make reasonable attempts to obtain all relevant information related to the fuels and fire hazard of, and if required, beyond the activity area or property boundary from the client;
- Prior to field work, review collected information;
- Conduct field work within the limits of and, if necessary, beyond the property at an intensity appropriate to the method of the assessment, plan and/or prescription required to meet the requirements of existing jurisdictional guidelines;
- Consider both fire and fuels hazards and their potential consequences on the identified values at risk;
- Notify the client as soon as possible if specialty services or changes in scope of work are required, and of associated changes to the original cost estimate;
- Write the report clearly, concisely and completely, and conform, where applicable, to jurisdictional guidelines for fire and fuels reports;

- Consider having a peer review completed of the report, depending on the complexity of the project, the member's level of competence, and the needs of the client; and
- Submit a copy of the report to the client, consistent with ABCFP Bylaw 10.

After a report is complete, the forest professional is responsible for:

- Respond to questions the client/employer and/or Approving Authority may have with regards to the fire and fuels assessment, plan and or prescription, providing professional opinion as appropriate; and
- Supervise activities in accordance with ABCFP guidelines. The forest professional is responsible for all professional forestry work that he or she supervises.

Considering the responsibilities a forest professional has to the public, to the profession, to his or her client/employer, and to other members, in accordance with the ABCFP Code of Ethics, if the client/employer chooses to not follow recommendations of the forest professional, the forest professional is expected to:

- Advise the client or employer of the potential consequences of their actions or inactions, in writing if appropriate; and
- Consider whether the situation warrants notifying the ABCFP, the land owner (if different from the client/employer) and/or other appropriate authorities.

The above actions are expected to be taken particularly if loss of life and/or other significant negative consequences are a possibility, or if workplace safety or the environment is potentially jeopardized. The forest professional should ensure that his or her role, in relation to the client/employer and the Approving Authority, is clearly defined and understood. Given that the detailed requirements of specific assessments, plans and or prescriptions, in association with the management of fire and forest fuels in interface areas, are fairly recent requirements of provincial and local governments, many clients may not have been previously involved with fire and forest fuels management, or may not have previously engaged the services of a forest professional. In these instances the forest professional should consider discussing the typical requirements and responsibilities with the client to assist in establishing an appropriate agreement for professional services.

Forest professionals must inform the client of any legal obligations (e.g. bylaws, provincial legislation) for actions to be taken, such as forest modification to reduce fuel hazards, and help them to understand why they should seriously consider the conclusions and/or recommendations of the professional (e.g. reduction of fire

hazard, mitigating risk to public safety). The Approving Authority may require covenants, or the proposed industrial activity and/or development could be turned down. Given the potential implications of the assessment it is important that fire and forest fuel assessments, plans, and prescriptions are carried out as early as possible within the project cycle.

Therefore, a coordinating member is required to take professional responsibility for professional work associated with fire and fuels management. This includes identifying if the coordinating member is the only professional involved or if a professional who is managing a team. If the member is managing a team, he or she is responsible to ensure that all team members are appropriately competent, and may also be responsible for all aspects of safety on the project.

### **2.2.1 Specific to Consultants**

With assistance from the forest professional, the client and the professional should complete an agreement confirming scope, schedule and compensation for the fire and fuel hazard assessment; need and scope of specialty services; and need for an external peer review. It is recommended that such an agreement include a clause that deals with confidentiality issues due to the forest professional's potentially conflicting obligations under the ABCFP Code of Ethics - to the public, as well as to the client or employer. (The forest professional also has obligations to the profession and to other members.) In certain circumstances the forest professional may have to convey adverse hazard assessment and or wildfire risk findings to parties who may not be directly involved, but who have a compelling need to know. Following is suggested wording for such a clause:

*"Subject to the following, the forest professional will keep confidential all information, including documents, correspondence, reports and opinions, unless disclosure is authorized in writing by the client. However, in keeping with the forest professional's obligations to the public as stated in the ABCFP's Code of Ethics, for good stewardship (11.3.4) and the safety of others (11.3.10), if the forest professional discovers or determines that there is a material risk to the environment or the safety, health and welfare of the public or worker safety, he/she shall notify the client as soon as practicable of this information and the need that it be disclosed to the appropriate parties. If the client does not take the necessary steps to notify the appropriate parties in a reasonable amount of time, the forest professional shall have the right to disclose that information in order to fulfill his/her ethical duties and the client hereby agrees to that disclosure."*

\*\* ABCFP recommends that any such wording be confirmed with legal counsel before using.

The client should be advised that the forest professional's cost estimate may need to be amended during the assessment, depending on the findings and analysis. As

the client may need to decide between allocating limited funds for fire and fuels management activities or using it for other important needs, it will be beneficial to demonstrate how following the forest professional's recommendations will be a good use of the overall funding available. This information will also be useful if the client is contemplating various risk management opportunities such as a cost-share agreement with other parties.

The client should also be advised that a fire and fuels hazard assessment, plan and/or prescription do not guarantee that the results will be favourable for the proposed activity or development. The cost estimate and potential results should be discussed with the client prior to, and during, the assignment.

### **2.3 The Approving Authority**

A local government, or the provincial government in the case of provincial Crown land, will typically initiate the requirement for an assignment or work related to fire and fuels management and is the Approving Authority. Often local government representatives will consult with provincial government representatives, such as under the Strategic Wildfire Prevention Initiative or when a burning treatment is prescribed. There are a growing number of local governments that are requiring fire and fuels hazard assessments as part of local Development Permit Areas (DPAs). These currently include several jurisdictions on Vancouver Island, as well as:

- City of Kelowna
- District of West Kelowna
- City of Prince George
- District of North Vancouver
- Regional District of Central Okanagan
- Regional District of East Kootenay
- District of Maple Ridge (proposed but not yet approved as at the time of writing)

Within these DPAs an Approving Authority can be an approving officer, building inspector, or planner and/or council of a local government. Before the fire and fuels hazard assessment is initiated it is expected the Approving Authority representative will:

- Inform the client/employer why a fire and fuels hazard assessment is required; and

- Provide the client/employer with guidelines that exist for carrying out a fire and fuels hazard assessment and/or preparing a fire and fuels hazard assessment report.

Following the fire and fuels assessment, it is important that the Approving Authority representative:

- Review the fire and fuels hazard assessment and the assessment report; and
- Discuss the report with the forest professional, seeking clarification as needed.

The Approving Authority may be guided by the BC Edition of the FireSmart Manual – Protect Your Home from Wildfire (Office of the Fire Commissioner, 2004).

### **3 Professional Liability Associated with Fire and Fuels Management**

In the event of a damaging wildfire, the alleged damage losses and/or personal injury claims can be substantial. Forest professionals undertaking projects involving fire and fuels assessments, plans, prescriptions and reports, as individuals or as part of a team, are exposed to potential claims for errors and omissions or professional liability. Within other professions (for example geoscientists) the current practice in the legal profession is to identify all participating professionals in legal actions such that the largest number of participants have potential to contribute to the loss or damage allegedly suffered by the plaintiff(s). While a forest professional may have no real exposure to a claim for professional negligence, he/she may still have to expend considerable time and expenses to defend himself/herself (VanDine, 2011).

Other types of claims could include suppression costs and damages associated with the fire losses in situations of a prescribed fire escape where a professional is involved in the development or implementation of a prescription. Professionals may be involved in regulatory inspections that if not conducted correctly could result in fire losses associated with suppression and damage related costs.

In the event of a damaging wildfire, the alleged damage losses and/or personal injury claims can be substantial. Forest professionals conducting fire and fuels projects should consider carrying errors and omissions (now more commonly referred to as professional liability) insurance. Such insurance covers a professional for the legal, expert and court costs of defending the claim. If liability is established, professional liability insurance will indemnify the professional for the judgment up to the limits of liability in the insurance policy, less the deductible.

Non-professionals carrying out fire and fuels projects typically cannot obtain professional liability insurance. Professionals who do have professional liability insurance are typically not covered by such insurance when they practise outside their area of expertise or scope of practice.

In Canada, professional liability insurance is written in a claims made format. In other words, the insurance policy will respond to a claim made and first reported within the policy period, regardless of when the alleged negligent act occurred. As a result, it is very important to report all claims and possible claims to the insurer as soon as they come to the attention of the professional. Any delay in reporting of a claim can lead to a lack of coverage of the claim under the insurance policy.

## **4 Due Diligence in Fire and Fuels Management**

As part of due diligence of the professional in fire and fuels management, there needs to be a clear understanding of jurisdictional issues related to the work assignment. Understanding when the work is regulated under provincial statute, local government bylaws and/or the specifications of a private land owner is fundamental to determining of the requirements of the work.

Under Section 29(a) of the *Wildfire Act*, if a person uses due diligence to prevent a contravention of the Act, such due diligence is considered to be an adequate defense for the contravention. Establishment of a due diligence defense is up to the person conducting the industrial activity. Under the ABCFP Standards of Practice – Bylaw 12, due diligence is a standard for a forest professional’s work that includes being prudent and doing all work with constant and careful attention. It is important to recognize that in the delivery of professional service, a forest professional’s standard of practice may be used to support a due diligence defense by the person conducting the industrial activity under the *Wildfire Act*.

### **4.1 Forest Professionals and Due Diligence**

Members must exercise professional judgment when providing professional services associated with fire and fuels management works. It is worth noting that the application of these guidelines can vary depending on the circumstances. Despite the purpose and scope of these guidelines, the decision of a member to not follow one or more aspects of these guidelines does not necessarily mean that he or she has failed to meet appropriate standards or practices in the performance of professional services. Such a judgment or decision will depend upon an evaluation of all facts and circumstances in a particular project and should be supported by a rationale as to why the guidelines were not followed.

The ABCFP supports the principle that its members should receive fair compensation for professional services, to ensure that professional services can be



carried out appropriately. Inadequate compensation is not a justification for services that do not meet the standards set out in these guidelines. Members should discuss these guidelines with their clients or employer when receiving instructions for an assignment.

Members must only practise in areas they are adequately trained and experienced. Forest professionals have a responsibility “to practise only in those fields where training and ability make the member professionally competent.”<sup>3</sup>

Generally, the client or employer holds the obligations defined by the *Wildfire Act* and its Regulation, and the forest professional is engaged, or has a role, to aid or assist the client or employer in this regard. For detail on how a forest professional can demonstrate due diligence, as an aspect of professional practice, please refer to Section 6 of this document.

## **4.2 Overview of Jurisdictional Requirements**

Forest professionals practicing in the area of fire and fuels management are expected to be aware, and have a solid understanding, of relevant jurisdictional requirements. This will contribute to their achievement of the standard for due diligence. In any location, one or more jurisdictions may be involved including federal, provincial or local government. These requirements may be legislated statutes and regulations or bylaws, and they may relate to other documents such as an official community plan. In addition, each jurisdiction may provide general guidance or expectations. The following sections identify some of the jurisdictional requirements that a forest professional should be aware of and understand.

### **4.2.1 Federal Government**

A number of federal requirements may apply when working in fire and fuels management in BC, such as: *Canadian Environmental Protection Act*, *Fisheries Act*, *Forestry Act*, and *Species at Risk Act*. In addition, the federal government is responsible for the FireSmart program.

### **4.2.2 Provincial Government**

The BC government, similar to all provincial governments in Canada, has a FireSmart program that is intended to encourage local governments and the public to take actions that will help to minimize potential damages from wildfire in urban-interface areas.

The BC Wildland Fire Management Strategy, 2010, provides an overview of BC’s proactive approach to managing wildland fire and can be a valuable resource to forest professionals practising in the area of fire and fuels management.

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<sup>3</sup> ABCFP Bylaw 11.3.7



On Crown land, fire and fuels management in BC is regulated by the *Wildfire Act* and *Wildfire Regulation* which was proclaimed on March 31, 2005. This legislation replaced the requirements for fire related activities that were previously outlined in the *Forest Practices Code of British Columbia Act* and the *Forest Fire Prevention and Suppression Regulation*.

The intent of the current *Wildfire Act* and *Regulation* is to “fulfill key recommendations from the BC Auditor General’s 2001 report and the Firestorm 2003 Provincial Review.” According to the province, this Act will be “clearly defining specific responsibilities of all users of the forest with respect to fire use, prevention, control operations and rehabilitation. The *Wildfire Act* and *Regulation* focuses on results instead of complex prescriptions and supports greater operational flexibility at the local level” (Province of BC, 2005). This change, from the *Forest Practices Code of BC*, and the associated *Forest Fire Prevention and Suppression Regulation*, allows for a greater reliance on forest professionals in the achievement of legislated requirements.

Recent *Wildfire Regulation Amendments* and a supporting *Interpretive Bulletin* were circulated to all forest industry licensees and the MFLNR in June of 2011 (*Wildfire Management Branch*, 2012). This recent bulletin replaces all previous bulletins on the topic. Among other things, it clarifies that the responsibility of meeting legislated requirements remains with the person carrying out the activity (client or employer), and that this person will typically engage, and rely on, a forest professional to provide expertise that will support the achievement of those legislated requirements.

#### **4.2.3 Local Government**

The extent to which local governments are involved with fire and fuels management, and associated interface fire risk in a given community is community specific, and dependent on the application of legal powers to undertake policy and bylaw development and bylaw enforcement. The use of legal powers has varied significantly around the province. According to the Auditor General, the state of emergency planning varies considerably both in terms of whether such plans have been developed or not and, where they have, how adequate they are. In the absence of local open fire related bylaws, the *Wildfire Act* and *Regulations* apply.

In 2004, the provincial government introduced *Bill 54 – Miscellaneous Statutes Amendment Act* that required regional districts to prepare emergency plans for their electoral areas and to create emergency management organizations to develop and implement the emergency measures by January 1, 2006.

The *Local Government Act* (1996) and fire protection requirements do not clearly spell out municipal and/or fire protection service area responsibilities for prevention, preparedness, or hazard mitigation. Fire management protocols vary between municipalities and fire protection areas.

At the local government level, fire departments, emergency program coordinators, development/planning directors and local government officials may play a significant wildfire management role in capacities that vary by community (Auditor General, 2001). Local fire departments have traditionally been first responders to all fire within their boundaries. However, when required, they may call on other resources, including the FLNRO Wildfire Management Branch for assistance if fire behaviour and/or fire size exceeds their resource capacity and capability. In addition, the Wildfire Management Branch may take over a local fire without request (or approval) if the fire is determined to be a threat to public safety or to surrounding forest or grass lands outside the local jurisdiction.

## **5 Professional Practice in Fire and Fuels Management**

### **5.1 Fire and Fuels Management and the Practice of Professional Forestry**

The practice of professional forestry, as defined in the *Foresters Act*, applies to many activities within the field of fire and fuels management. As with other forestry activities, working within the field of fire and fuels management requires specific skills, education and training and, as per ABCFP Bylaw 11.3.7, members should only engage in those activities for which they have the appropriate, “education, training and experience.” As per ABCFP Bylaw 12.2.1, competent members must “maintain sufficient knowledge in their field(s) of practice.” While there is overlap between some of these skills and those required in other streams within the practice of forestry, there are stream-specific skills, education and training associated with fire and fuels management.

Practising within the field of fire and fuels management requires a specific education and training in subjects such as, but not limited to: fire ecology, fire effects, fire behaviour, fire regimes, condition classes, fuel types, fuel moisture content, fire suppression, prescribed burning fire behaviour modeling and fire weather. It also requires education and training in, and an understanding of, general forestry subjects such as ecology, silvics, silviculture and forest health. For the most part, the education provided at post-secondary schools is insufficient and often additional expertise is obtained through experience fighting wildfires or working with a competent forest professional already practising in the field, or through training provided by or within the Wildfire Management Branch.

Fire and fuels management activities may be undertaken at either the stand level (such as in the wildland urban interface) or the landscape level. However, the skills and training necessary to competently undertake associated fire and fuels management activities are essentially the same.

## **5.2 Surveying and Quantifying Stand and Site Attributes**

The practice of professional forestry includes the collection and analysis of field data, and the application of that information into the development of forest related plans and prescriptions. In fire and fuels management, this professional work requires not only general survey skills, but also skills that are specific to the collection and analysis of data that will be used in the development of fire and fuels related plans and prescriptions. Carrying out fire and fuels related surveys requires specific skills, training, education and experience to ensure the appropriate information is obtained to an acceptable standard and intensity and that appropriate analysis of the data is carried out.

Specifically, fire assessment surveys collect information on ecology, species, stand density, vegetation complex, soil data, forest health, etc., and require very specific education, training and experience. Surveys must be undertaken according to scientifically sound and statistically acceptable methodologies in order to quantify such attributes as stem density, fuel loading, vegetation inventory, habitat types as well as other site values. Extensive training and experience is required to survey to an acceptable standard. Surveyors must also have a solid understanding of the available methodologies and the outputs produced and what they mean with regards to such aspects as fire behaviour and fire effects.

Understanding survey outputs is essential to producing meaningful stand/site descriptions and summaries to the client, and is necessary when the outputs will provide the basis for developing professional fire and fuels related documents or modelling fire behaviour. Specific knowledge in fuel loading, fuel classes, fuel moisture, fire weather and how they affect fire behaviour is critical when quantifying fuel loads for input into fire behaviour models. Poor data inputs into fuel loading models produce inaccurate results that can negatively impact a stand, including the values within and adjacent to it, in the event a wildfire burns through the subject area. Understanding fire ecology and the fire effects on tree species, vegetation (native and invasive), duff, soil and wildlife is critical for ensuring good stewardship. Proposing inappropriate treatments can negatively and irreparably damage ecosystems and water systems.

### **5.3 Implementing Fire Behaviour Modelling**

The ability to model fire behaviour is critical to determine the appropriate post-treatment stand conditions and the treatment regimes for achieving these conditions. Incorrect behaviour predictions will result in treatment regimes that treat a stand too much or too little, both of which can negatively impact the stand and possibly contribute to a loss of in-stand and adjacent values.

Learning to use a fire behaviour model can often be done through software tutorials or manufacturer training. However, the understanding of how data inputs such as slope, aspect, fuel loading, fuel moisture, and fire weather affect fire behaviour can often only be learned in the 'real world' such as on the fire line or on prescribed burning operations (this could be applied to fuel management, habitat burning, silviculture, ecological restoration and a variety of other objectives). As such, participating in, or having past work experience in fire suppression or prescribed burning is an invaluable asset toward understanding fire behaviour, input variables and the outputs from behaviour modelling.

Utilizing the output of these models in some form of forest management, such as incorporating them in fire and fuels management plans, is an important professional forestry practice to learn and in which to be proficient. While non-professionals may model fire behaviour and use fire modelling results in their work, a forest professional is responsible for deciding how to use and apply modelling results when developing professional documents or carrying out other fire and fuel related activities within their professional practice.

### **5.4 Fire and Fuels Management Prescriptions and Plans**

Similar to other forestry documents such as forest management plans, forest stewardship plans and site plans, fire and fuels related documents (including Fuel Management Prescriptions and Plans (FMPs), prescribe burn plans, and ecological restoration prescriptions) are developed to guide the management of forests toward specific conditions. Development of the aforementioned documents is considered professional forestry and they should be developed by forest professionals operating within their scope of practice and signed and sealed in accordance with ABCFP bylaws.

The development of FMPs not only requires the collection of data mentioned in earlier sections, but also the synthesis of this data and the development of a prescription that will move a stand to a specific, predicted condition. This is best undertaken by a forest professional who is competent and experienced, having the skills and education required to make such predictions. Similar to the negative impact that can be experienced when professionals work outside their scope of practice to develop other types of management plans, poorly prepared or inappropriate FMPs can have severe implications on whole ecosystems or individual

species within the sites being prescribed. A thorough understanding of the effects of the prescription is necessary to ensure appropriate treatment regimes are prescribed.

## **5.5 Monitoring and Post-Treatment Reporting**

The proper implementation of any type of forest management plan or prescription is as critical as the development of that plan. Inappropriate treatment of a stand due to poor execution of the prescription is similar to having prescribed an inappropriate treatment. It is essential that care be taken to ensure the operator understands the prescription and implements it accordingly. Monitoring operations is the most effective means to ensure proper prescription implementation and best done by the signing forest professional, or another competent forest professional who is experienced in the field of fire and fuels management and treatment operations.

It may be acceptable for a competent supervisor who is not a forest professional to supervise the implementation of the prescription if that supervisor is deemed competent in the field of fire and fuels management operations and is trusted by the signing professional. It should be noted that it is the prerogative of the client or employer to choose a different application or to ignore the prescription. In this case, choosing to apply a prescription differently than prescribed may become a liability for the client or employer.

Post-treatment reporting serves to not only confirm that the prescription has been correctly implemented but can also be used to survey for unintended operational impacts (incidental tree damage, excessive ground disturbance, potential erosion issues, forest health issues, etc.). Proper surveying of the site, and follow-up prescriptive measures for correcting any post treatment issues, requires a professional competent in the fields of forest ecology, soils, hydrology and forest health, and prescribing rehabilitative treatments. Post-treatment reports should be considered professional documents and, therefore, the practice of forestry to be carried out by a forest professional.

## **5.6 Demonstrating Due Diligence**

There are a number of recommendations for a forest professional to carry out and demonstrate his or her due diligence when performing fire and fuels management activities. Please refer to the ABCFP guidance document “Standards of Professional Practice: Guidelines for Interpretation – January 2010” for more detailed information on this particular practice standard.

### **5.6.1 Supporting Rationale**

A key component of a member's quality management program, and due diligence, is having a documented rationale to support his or her plan or prescription (site plans for fuel treatments, prescribe burn plans, fuel hazard assessments, ecological restoration plans, smoke management plans). In general, a supporting rationale in the fire and fuels context relates to the documented fire and fuels hazard and the proposed abatement method and treatment, other supplementary data upon which the plan is based, and the application of particular hazard abatement techniques, such as prescribed burning, pile burning or mechanical treatments.

### **5.6.2 Independent Peer Review**

Where the member considers it appropriate, his or her quality management program and due diligence can include an independent peer review of those aspects of a fire and fuels hazard assessment, or other fire and fuels related plan, or prescription that is considered complex and/or where life safety implications are a major factor. It is suggested that a peer review should occur as early as the design/planning phase of the project and before relevant aspects of the project are completed.

The reviewer should be independent of the project team and have not been involved in the development of any stages of the original plan. Independent peer reviews can be performed by members within the same firm that generated the original plan provided that an independent perspective is maintained.

The extent of peer review will be based on the professional judgment of the members. Considerations should include the probability of fire in the project area; the fire behaviour potential, the values at risk; availability, quality and reliability of background information and field data; and the member's training and experience.

The independent peer review will be appropriately documented and, as a minimum, contain a sealed letter or report to be included in the plan, which includes the following:

- Limitations and qualifications with regards to the review; and
- Results of the review.

For both internal and external peer reviews, the name of the reviewing member will be identified in his/her report.



## 6 Skill Sets for Professional Practice in Fire and Fuels Management

To practise forestry in the field of fire and fuels management, forest professionals require core knowledge and general familiarity in the field, as well as field skills and experience specific to the area of fire and fuels management.

The discussion regarding core knowledge and general familiarity is distinguished by an understanding, ability and familiarity with the described components of fire and fuels. This distinction is necessary to convey the basic content of knowledge but not the depth, comprehension or analysis of the knowledge. This degree of performance of the requisite knowledge will depend on the circumstances, the location and the professionals involved.

### 6.1 Core Knowledge

#### An Understanding of Fire and Fuels Management Goals and Objectives

The goals and objectives of fire and fuels management are not readily evident in any BC acts or regulations or clearly defined by any of the government agencies associated with fire or forestry management. Similarly, absent are best management practices. BC's Wildland Fire Management Strategy – September 2010 provides some guidance in this regard by identifying provincial level goals and strategic priorities; however they are very broad and general, such as “reduce the hazards and risks associated with wildland fire in and around communities and other high-value areas.” The lack of a definitive set of specific goals and objectives to be achieved in the planning and implementation of fire and fuel management projects places an exceptional onus on forest professionals to establish them without specific legislative or regulatory guidance. Additionally, it is the client's or employer's prerogative to accept, modify or reject recommendations provided by forest professionals.

Generally, the establishment of specific goals and objectives for fire and fuel management activities are determined by a forest professional on a site-specific basis. Fire is a natural occurring event and as long as there are combustible fuels in our forests, there will be fires. As such, setting goals to prevent, eliminate or stop wildfire initiation and spread is ecologically inappropriate. Instead, the main goals of fire and fuel management activities should generally involve the reduction of potential fire behaviour and improvement of safety and effectiveness in suppression efforts. More specific types of fire and fuels management goals include:

- A significant reduction in the potential for candling and crowning to help minimize medium and long distance spotting and associated suppression safety challenges;
- A reduction in frontal fire intensity and rate of spread;

- A reduction in overall fuel volume and continuity, both horizontally and vertically, to significantly reduce fire effects, improve fire line safety and increase the effectiveness of aerial suppression resources; and
- The creation of defensible space or an otherwise safer, more efficient location to conduct suppression activities.

Broader forest management goals should also be considered, and may include:

- Improved forest health by reducing inter-tree competition and removing diseased trees
- Increasing ungulate forage and browse opportunities
- Identification and retention of key wildlife habitat features such as dens and wildlife trees
- Other site specific goals

#### **Understanding Wildfire Suppression Principles in BC**

Wildfire suppression principles and tactics in BC have developed over the last 100 years and vary with fuel type, topography, weather conditions, safety and numerous other factors. Basic suppression principles and tactics are accounted for in the S-100 Basic Fire Suppression and Safety training course developed by the Wildfire Management Branch; however it is recommended that forest professionals working in fire and fuels management seek and acquire training and experience that will prepare them for the potential complexities and liabilities associated with wildfire suppression. The principles of wildfire behaviour, wildfire attack and control methods, danger tree management and mop-up techniques as practised in BC must be understood in order to achieve some of the basic goals and objectives for fuels management.

#### **Understanding of Wildfire Behaviour Principles**

Wildfire behaviour is based on three main factors: fuels, weather and topography. The interaction of these three factors must be clearly understood by all forest professionals to develop strategies that minimize or reduce wildfire behaviour through fuel management planning and operations.



### **Ability to Appropriately Assess Wildfire and Fuels Hazards**

The basis for determining wildfire hazards or threats and prioritizing forest fire and fuels management treatments involves the accurate and consistent assessment of the fuel, weather and topography of a unique polygon or larger scale area. The Wildfire Management Branch developed a Wildfire Threat Rating Guide and associated worksheet in 2008 and upgraded these documents for release in 2013. To accurately complete this wildfire hazard assessment process, the forest professional must have the field skills to determine:

- Biogeoclimatic zones
- Vegetation composition
- Crown closure
- Stems per hectare by size classes
- Percent cover for varying sizes of fuels
- Slope, aspect, terrain features
- Wildland urban interface development characteristics that can affect overall wildfire threats to structures, communities and developments

This guide and worksheet were designed to provide a numerical rating for wildfire threats in the Wildland-Urban Interface and are not intended to assess the wildfire hazard for post-harvest activity fuels as required under the *Wildfire Act* and Regulations. Additionally, the guide and worksheet is only one tool for determining wildfire threats within a specific area. The forest professional is expected to not only accurately and consistently interpret the results of these assessments but also to be able to identify less tangible site characteristics not covered by the worksheet, which will impact the overall wildfire threat and as well as the associated mitigation strategies.

As an example, communities with very steep slopes above or below the developed area may not allow fuel management treatments due to operational limitations, safety issues, slope stability or limited access. Also, the layout of the community, the general condition of adjacent structures, the access for suppression crews, available water resources, and numerous other factors impact a community's overall fire threat.

Such conditions need to be considered by the forest professional but are not explicitly addressed on the worksheet. As such, alternate strategies to reduce the threat to structures will need to be developed.

### **Familiarity with BC Ecosystems**

Forest professionals must be familiar with the forest ecosystems in which they are practising fire and fuels management. This includes succession patterns, disturbance regimes, stand development processes, key wildlife habitat features, individual tree characteristics, forest health challenges and other unique attributes that must be managed for within a specific ecosystem.

## **6.2 General Knowledge**

### **Understanding Wildfire Terms and Concepts**

Familiarity with wildfire regimes, frequencies, cycles, natural disturbance types, climate change and other terms and concepts which can directly impact on fire and fuels management planning and activities is required. These terms are well defined in literature from BC and other locations in North America. The appropriate peer reviewed articles (scientific journals) and reports (Wildfire Management Branch, Canadian Forestry Service, and or specific project reports) need to be identified and itemized or collected as part of an ongoing professional development program.

### **Familiarization with the Canadian Forest Fire Danger Rating System Fuel Types**

Seventeen fuel types are described within the Canadian Forest Fire Danger Rating System. These fuel types are more descriptive of stand structure than the individual tree species for which they are labeled. The stand structure is expected to produce specific potential fire behaviour, including intensity and rates of spread. Assessing and planning fire and fuels management activities is partly dependent on correctly identifying fuel types.

### **Assessing Surface Fuel Loading by Size Class**

Surface fuel loading is one key assessment criteria for determining wildfire hazards and mitigation strategies. Correctly assessing and quantifying surface fuel loading is critical in determining potential post-activity fire behaviour. The Wildfire Management Branch document A Guide to Fuel Hazard Assessment and Abatement in British Columbia is intended to assist forest professionals with the task of assessing post-harvest wildfire hazard using slash type, slope, aspect and surface fuel loading.

The challenge with this system is to accurately determine tonnes per hectare due to the very limited guidance on how to properly measure this attribute. One of the only documents that provide procedures for determining tonnes/hectare is the FRDA 001 Field Handbook for Prescribed Fire Assessments in British Columbia: Logging Slash Fuels, and provides a visual system for determining surface fuels loads and expresses this measurement in tonnes per hectare.

### **6.3 Field Skills and Experience**

Forest professionals undertaking fire and fuels management activities are expected to have associated field skills and experience. Some examples of the types of skills and experience that may be required are:

- Field Fitness – the ability to walk through aggressive topography and site conditions while completing layout, GPS and forestry plots
- Fuels Management Treatment Unit Layout – standard skills and experience with flagging and marking treatment unit perimeters, wildlife trees, no work zones, riparian areas and other site specific features and attributes to a similar standard required for timber harvesting
- Fire Behaviour – an understanding of fire behaviour in relation to various fuels, topography and weather
- Riparian Management – familiarity with timber harvesting riparian management guidelines
- Danger Tree Management - danger tree assessment and marking techniques as described in the appropriate Wildlife Danger Tree Assessor’s Course
- Tree and plant identification – the ability to identify all tree species and the main shrub, herb and forb species within the area of interest
- Forest Health Factors – ability to identify forest health issues in the field and associated options for mitigation
- Knowledge of safe operating limits for machinery and personnel who may undertake the treatment

## **7 Fire Management and Fuel Management Plans and Prescriptions – Consideration by Forest Professionals**

Forest professionals could be involved with many different levels of planning for fire and fuels management. The consideration and skills required for each level are outlined below:

1. Upper Level Plans involve Forest Stewardship Plans, Land Use Plans, District Fire Management Plans and others require the following skills and experience.
  - a) Understanding of the basic goals and objectives of fuels management to reduce wildfire hazards at a landscape-level. This often focuses on:

- The development of landscape level fuel breaks to assist with suppression and safety for large wildfires;
- Identification of high-value developments, infrastructure or wildland urban interface areas within the area covered by the plan;
- Main road systems for access and fuel breaks; and
- Active and deactivated road systems that may be useful for access and fuel breaks.

b) Ability to identify high hazard forest types or site disturbances that should be managed for wildfire hazards in the interface (i.e. fuel loading - continuous areas of mountain pine bark beetle killed lodgepole pines, extensive windthrow, wildfire mortality).

c) Ability to identify low fire hazard areas where fire spread and intensity is limited and suppression success is high (i.e. non-productive sites or recently harvested areas not regenerated to conifer cover; prescribed burn and wildfire areas with minimal surface fuels; plantations with high crown closure, rangelands).

d) Identification of proposed harvest areas within interface zones and the requirement for site specific fuel management activities to be included in site plans.

e) Identification of areas where wildfire suppression may not be required (modified response fires) where wildfire is not going to significantly impact on other values or where wildfire suppression may cause more harm than good.

f) Familiarity with GIS-based wildfire behaviour models which can develop numerous wildfire behaviour mapping products based on available vegetation resource inventory data.

## 2. Community Wildfire Protection Plans (CWPPs):

Community Wildfire Protection Plans are local-level plans which focus on the identification of wildfire threat areas and provide goals, objectives and general strategies for wildfire hazard mitigation. They also identify land use conflicts, and key forest values that must be considered within the assessment area. Community Wildfire Protection Plans are the plans that assist in directing fire management plans and site specific plans within a geographic area.

The skills required to complete CWPPs include:

- Wildfire hazard and risk assessment and mapping;
- Understanding of wildfire behaviour and suppression techniques;
- The goals and objectives of fuels management to mitigate wildfire hazards at the landscape and wildland urban interface levels;
- Understanding of the biogeoclimatic zones and forest succession processes where the work is to be undertaken;
- Understanding of forest health risks and associated mitigation options; and
- Implications of fuels management on overall wildfire hazard and risk and other resource values.

3. Site Plans for timber harvesting, silvicultural activities, ecosystem restoration planning or similar operational planning where wildfire hazards may be impacted by forest management activities on specific, unique locations.

Site plans and other similar professionally produced documents are often not directly focused on fuels management but may have an indirect impact on wildfire hazards as the result of the planned operations. The possible creation of wildfire hazards must be assessed and managed for as required under the *Wildfire Act*, Part 1, Section 7. The factors to consider at this planning level include:

- Wildland urban interface values if present (typically within two kilometres of developments or infrastructure).
- The need for post-activity wildfire hazard assessment within a specified time period (as required by the current *Wildfire Act*, Section 7 and Wildfire Regulations, Sections 11 and 12).
- The surface fuel-loading targets (as specified in the Wildfire Management Branch guidance document entitled *A Guide to Fuel Hazard Assessment and Abatement in British Columbia*.)
- Professional development of a standard operating procedure or site-specific treatment plan which addresses all local wildfire related issues, in order to meet the wildfire hazard mitigation intent of the *Wildfire Act* and Regulations (as suggested in the *Guide to Fuel Hazard Assessment and Abatement in BC*, Section, pages 8 and 10 (Wildfire Management Branch, 2012)).
- Standard and accepted wildfire hazard reduction strategies.

- Tenure options and application processes for implementing CWPPs.
4. Forest Fuel Management Prescriptions or Plans where fuels management, or wildfire hazard reduction, are the main objectives of the planned operational treatment.

Forest professionals who intend to develop and plan operational fuels management treatments at the landscape- or interface-levels are expected to have the following knowledge and skills:

- Wildfire hazard mitigation planning and the expected modification in wildfire behaviour;
- Fuel management cost estimating and prioritizing of treatment units;
- Standard practices for managing forest fuels to reduce wildfire threats to developments and infrastructure;
- Firefighting basics - resources, equipment, techniques;
- The forest fuel management activities on other forest values including; wildlife, visual, water, recreational, range, timber quality, archeological and cultural values etc.;
- Impacts on stand stocking, volume, species composition;
- Ecosystem restoration benefits or impacts;
- Impacts on forest health – including susceptibility to beetle attack;
- Impacts on stand succession;
- Post-treatment determination and reporting of results;
- Surface fuel loading tonnes per hectare concept and estimation;
- Red- and blue- listed species and overall wildfire habitat and values; and
- Danger tree management practices in BC (Wildlife Danger Tree Assessor’s Course).

## 8 Other Land Uses and Plans – Consideration by Forest Professionals in Fire and Fuels Management

Land use planning requires the consideration of multiple resource values on the landscape and the incorporation of resource specific objectives into the planning process and the plans themselves. Sometimes these objectives can be mutually exclusive and result in a conflict of objectives in the planning process. This is possible with objectives associated with fire and fuels management. Generally speaking, fire and fuels management treatments are intended to reduce the available fuels in a stand, often by reducing stem density, ladder fuels and coarse woody debris loading. Conversely, other land-use objectives can be oriented towards the promotion of higher density stands, incorporating the retention of coarse woody debris as a means to conserve green spaces or protect specific habitat. As such, the land-use planning process must find a way to balance fire and fuels management objectives with the management objectives of other values.

Fire and fuels management can have a variety of objectives but generally treatments involve the modification of forest fuels (standing, downed and vegetative) to such a condition that the potential fire behaviour at the stand or landscape level is altered to an intensity that is much less than would be experienced from the pre-treatment conditions. To achieve this objective, treatments involve the harvest or thinning of the main canopy and understory, pruning of residual stems, abatement of surface fuel loading (including the activity fuels), and sometimes the alteration of the vegetation complex. The modification of these fuel layers may have negative impacts on other resource values. Similarly, other management regimes intended to promote other resource values can conflict with fire and fuels management objectives.

Generally speaking, any reduction in the fuel loading will result in a decrease in fire intensity. However, some treatments can produce post-treatment conditions where the rate of spread of a fire can actually increase relative to the pre-treatment conditions. This is particularly true where flash fuels (such as grasses) or where there is a lot of fine woody debris loading on the site or where stand density is reduced to such a point that the in-stand wind speed potential increases. The resultant increase in potential rate of spread may be an acceptable compromise depending on site specific attributes, values at risk, and the need to balance fire and fuels management objectives with other resource objectives.

As such, if range objectives dictate more open stands, then planners need to consider that flash fuels and in-stand wind conditions will increase and result in higher potential rate of spread for fires in these stands. Similarly, the promotion of coarse woody debris retention in a prescription may increase surface fuel loading to such a point that surface fuel fire behaviour is greater than in the pre-treatment stand and is outside the levels of the historic fire regime.



Land-use planning objectives can often tend towards the protection of trees or conservation of higher density stands to achieve a variety of objectives: visuals quality, habitat, recreation, sensitive ecosystems, rare and endangered species, etc. Such objectives that conserve high density stands are in direct conflict with the objectives of fire and fuels management. Therefore, each site should be assessed by a qualified professional with extensive fire management experience who can recommend appropriate fire and fuels management objectives. These objectives should then be compared to the objectives of other resource values as proposed by other qualified professionals and then a balance sought between all objectives so that the appropriate degree of fire risk or fuel hazard reduction can be achieved.

### **Critical Contents for Plans and Prescriptions**

Fire and fuels management can be undertaken at either the stand level (such as in the wildland-urban interface) or the landscape level (as in the creation of landscape level fuel breaks). While objectives at both scales are generally oriented towards reducing fire within the treated area, interface treatments tend towards creating stands with lower stand densities as a means of reducing the wildfire risk to adjacent structures, and they are usually smaller in width (+\ - 100m). Conversely, landscape level treatments are usually associated with producing landscape level fuel breaks to interrupt the spread of wildfire in a particular direction or to slow down its progress. Since they are likely to have less adjacent structures at risk, stand densities can be higher and the breaks can be several times wider than typical interface treatments.

While the scales of treatments can vary, the consideration of site attributes or objectives are fairly consistent and are always site specific. Given the array of attributes being surveyed, forest professionals may find it worthwhile to consult other professionals (biologists, agrologists, hydrologists, etc.) to ensure they are considering all values within the stand.

The following list, while not complete, provides some direction to forest professionals regarding the attributes that should be given consideration in a fire and fuels related plan or prescription:

- Riparian management areas
- Rare plant communities
- Red- and blue-listed species
- Ungulate winter range
- Community or domestic water supplies
- First Nations, archaeological and heritage interests



- Visual quality objectives
- Recreation features
- Biodiversity objectives
- Timber use or improvements
- Range use or improvements

## 9 Definitions

*(As used in this guidance document)*

**Approving Authority** - the municipal council of the municipality if the land is located within a municipality and it can also refer to a regional board of the regional district if the land is located within a regional district but not in a municipality (and is neither Nisga'a Lands nor treaty lands of a treaty first nation)

For the purposes of this document, this would also include the land manager with regards to Crown land.

**Client or Employer** - An individual, company or entity that engages a forest professional to conduct activities related to fire and fuels management including but not limited to hazard and/or abatement assessment, fire management planning, developing prescribed fire management plans or prescriptions, community wildfire protection planning (including but not limited to identifying development permit areas, advising on development of bylaws and policy, carrying out FireSmart assessments) fuels management, ecological restoration, smoke management, fire suppression planning (incorporating modified response).

**Consequences** - A result or effect on human well-being, property or the environment due to a wildfire.

**Due diligence** – Exercising all reasonable care commensurate with the fire hazard. Reasonable care is assessed objectively based on what a prudent person acting reasonably would do in the same circumstances.

**Fire Danger** - A general term used to express an assessment of both fixed and variable factors of the fire environment that determine the ease of ignition, rate of spread, difficulty of control, and fire impact.

**Fire Danger Class** - A segment of a fire danger index scale identified by a descriptive term (e.g. Nil or Very Low, Low, Moderate, High, Very High, or Extreme), numerical value (e.g. I, II, III, IV, or V), and/or a colour code (e.g. green, blue, yellow, orange, or red). The classification system may be based on more than one fire danger index (e.g. the Buildup Index is sometimes used in addition to the Fire Weather Index). (CIFFC, 2002\*)

**Fire Environment** - The surrounding conditions, influences, and modifying forces of topography, fuel, and fire weather that determines fire behaviour. (CIFFC, 2002\*)

**Fire and Fuels Management Task Force (FFMTF)** - A task force formed in February 2011 at the direction of the ABCFP professional practice committee. The formation of the FFMTF was undertaken to address expressed public and member concerns regarding wildfires, specifically regarding risk to human safety and forest land values. (ABCFP, 2012)

**Fire Hazard** - A general term to describe the potential fire behaviour, without regard to the state of weather-influenced fuel moisture content, and/or resistance to fireguard construction for a given fuel type. This may be expressed in either the absolute (e.g. “cured grass is a fire hazard”) or comparative (e.g. “clear-cut logging slash is a greater fire hazard than a deciduous cover type”) sense. Such an assessment is based on physical fuel characteristics (e.g. fuel arrangement, fuel load, condition of herbaceous vegetation, presence of ladder fuels). (CIFFC, 2002\*)

A fuel complex, defined by volume, type, condition, arrangement, and location that determines the degree of ease of ignition and the resistance to control. (Hardy, 2005)

**Fire hazard abatement** - is the practice of reducing potential fire behaviour. Abatement practices, such as piling and burning slash, generally reduce both fuel hazard and fire risk by modifying fuel characteristics and reducing the probability of ignition. A similar definition is provided by the Canadian Interagency Forest Fire Centre, which defines hazard reduction as, “treatment of living or dead forest fuels to diminish the likelihood of a fire starting and to lessen the potential rate of spread and resistance to control.” (Forest Practices Board, 2008)

**Fire hazard assessment** - is an assessment of potential fire behaviour based on physical fuel characteristics, and the risk of a fire associated with that fuel igniting and/or spreading. (Forest Practices Board, 2008)

**Fire Management** - The activities concerned with the protection of people, property, and forest areas from wildfire and the use of prescribed burning for the attainment of forest management and other land use objectives, all conducted in a manner that considers environmental, social, and economic criteria. Note: Fire management

represents both a land management philosophy and a land management activity. It involves the strategic integration of such factors as knowledge of fire regimes, probable fire effects, values-at-risk, level of forest protection required, cost of fire-related activities, and prescribed fire technology into multiple-use planning, decision making, and day-to-day activities to accomplish stated resource management objectives. Successful fire management depends on effective fire prevention, detection, and pre-suppression, having an adequate fire suppression capability, and consideration of fire ecology relationships. (CIFFC, 2002\*)

**Fire Management Plan** - A statement of policy and prescribed actions with respect to forest fire (prescribed fires and wildfires) for a specific area which may include maps (forest cover, topographic and land ownership maps), charts, and statistical data. (CIFFC, 2002\*)

**Fire Management Planning** - The systematic, technological, and administrative management process of determining the organization, facilities, resources and procedures required to protect people, property, and forest areas from fire and to use fire to accomplish forest management and other land use objectives. (CIFFC, 2002\*)

**FireSmart** - FireSmart is living with and managing for wildfire on our landscape. Preparing for the threat of wildfire is a shared responsibility. From home owners, to industry and government we all have responsibility to lessen the effects of wildfire. By choosing to extend our lifestyle and communities further into forested areas, we become more exposed to the danger of wildfire. FireSmart Canada helps you understand the potential of wildfire affecting your home and your community. (FireSmart Canada Website <https://www.firesmartcanada.ca/what-is-firesmart>)

**Fire Threat** - Any method or exercise to analyse fire threat needs to address many issues relating to purpose, the inherent mobility of wildfire, rating and combining factors, probabilities, scale, management actions, boundaries, quantifying fire severity and constraints. The method needs to be neither simplistic nor too theoretical. Otherwise the results will lack validity, usefulness, or both; probably to a serious extent. (Analysis of Wildfire Threat – issues and options, DSE State of Victoria, Australia\*\*) )

**Forest Fire** - Any wildfire or prescribed fire that is burning in forested areas, grass, or alpine/tundra vegetation. (CIFFC, 2002\*)

**Forest Professional or Member** - Member of ABCFP who is authorized to practise professional forestry within the province of British Columbia.

**Fuel Hazard Reduction** - Treatment/removal of living or dead forest fuels to diminish the likelihood of a fire starting, and to lessen the potential rate of spread and resistance to control (MOE Glossary (H), 2012).

**Fuel Management** - The planned manipulation and/or reduction of living or dead forest fuels for forest management and other land use objectives (e.g. hazard reduction, silvicultural purposes, wildlife habitat improvement) by: prescribed fire; mechanical, chemical, or biological means; and/or changing stand structure and species composition. (CIFFC, 2002\*)

For the Ministry of Forests, Range and Natural Resource Operations Wildfire Management Branch, the primary objective is to manage forest fuels in and around communities in order to reduce the potential for devastating wildfires (Wildfire Management Branch, 2012)

**Fuel Type** - An identifiable association of fuel elements of distinctive species, form, size, arrangement, and continuity that will exhibit conditions characteristic fire behaviour under defined burning. Synonym - Fuel Complex (CIFFC, 2002\*)

**Government** - Regulatory authorities having jurisdiction over development on provincial Crown land or private land. Such authorities include federal, First Nations, provincial and local governments.

**Hazard** - A source of potential harm, or a situation with a potential for causing harm, in terms of human injury; damage to health, property, the environment, wildlife and other things of value; or some combination of these. (Risk Management Standard, 2006)

**High-Risk Activity** (Wildfire Regulation, Section 1 - Definitions) means:

- a) mechanical brushing;
- b) disk trenching;
- c) preparation or use of explosives;
- d) using fire- or spark-producing tools, including cutting tools;
- e) using or preparing fireworks or pyrotechnics;
- f) grinding, including rail grinding;
- g) mechanical land clearing;

- h) clearing and maintaining rights of way, including grass mowing;
- i) any of the following activities carried out in a cutblock excluding a road, landing, roadside work area or log sort area in the cutblock:
  - i. operating a power saw;
  - ii. mechanical tree felling, woody debris piling or tree processing, including de-limbing;
  - iii. welding;
  - iv. portable wood chipping, milling, processing or manufacturing;
  - v. skidding logs or log forwarding unless it is improbable that the skidding or forwarding will result in the equipment contacting rock;
  - vi. yarding logs using cable systems;
- j) to q) Repealed (B.C. Reg. 213/2008, s. 1 (b).)

**Licensee/Owner** - An individual, company, or provincial Crown agency that is the holder of a cutting authority or crown tenure (License of Occupation, cutting permit, other tenure). For the purpose of these guidelines, licensee includes land owners in the case of forest development on private property.

**Local Government** - municipalities, regional districts, First Nations, resort municipalities and, in some cases, the island trusts.

**Municipality** - A corporation into which the residents of an area are incorporated under the Local Government Act or another Act, or the geographic area of the municipal corporation.

**Partners in Protection** - multidisciplinary non-profit association, made up of members representing national, provincial and municipal associations, government departments responsible for emergency services, forest and parks management, land-use planning and private business and industry formed to facilitate interagency cooperation in the promotion of awareness and education aimed at reducing risk of loss of life and property from fire in the wildland urban interface. (FireSmart Canada website <https://www.firesmartcanada.ca/about> )

**Probability** - is a measure of the expectation that an event will occur or a statement is true. Probabilities are given a value between 0 (will not occur) and 1 (will occur). The higher the probability of an event, the more certain we are that the event will occur. (Wikipedia, 2012)

**Professional Practice Committee (PPC)** - A volunteer committee of the ABCFP that advises the chief executive officer on a range of policy issues relating to the practice of members who have achieved registration. The PPC oversees the Practice Advisory Service and produces guidance papers on a range of professional practice issues. (ABCFP website – Our Committees)

**Qualified Holder** - means a person, other than the government, (a) who is a party to a cost sharing agreement or service agreement, as defined in section 28 of this regulation, or (b) who (i) is the holder of an agreement or licence referred to in section 12 (1) (a), (c), (d), (e) and (g) and (2) (a) of the *Forest Act*, and (ii) is not in arrears under the Annual Rent Regulation for the annual rent payable respecting the agreement or licence. (Wildfire Regulation)

**Regional District** - One of 28 districts incorporated under the *Local Government Act*, or the geographic area of the district, that has authority to enact subdivision servicing and zoning bylaws.

**Values at Risk** - A specific or collective set of natural resources and human-made improvements/ developments that have measurable or intrinsic worth and that could or may be destroyed or otherwise altered by fire in any given area. Synonym - Values-at-Stake. (CIFFC, 2002\*)

**Wildfire** - An unplanned or unwanted natural or human-caused fire, as contrasted with a prescribed fire. (CIFFC, 2002\*)

**Wildfire Risk** - The exposure to the chance of loss from wildfire. For example, there is a 25% chance that a value at risk will be destroyed by a wildfire sometime in the next 50 years. Risk can also be calculated by multiplying damage (or loss) by uncertainty. (CIFFC, 2002\*)

The chance that a fire might start, as affected by the nature and incidence of causative agents. (Hardy, 2005)

**Wildland Urban Interface** - A popular term used to describe an area where various structures (most notably private homes) and other human developments meet or are intermingled with forest and other vegetative fuel types. (CIFFC, 2002\*)

\* Canadian Interagency Forest Fire Center, The 2002 Glossary of Forest Fire Management Terms. [http://www.env.gov.bc.ca/esd/fire\\_mgmt\\_gloss\\_2002.pdf](http://www.env.gov.bc.ca/esd/fire_mgmt_gloss_2002.pdf)

\*\* Analysis of Wildfire Threat – issues and options, DSE State of Victoria, Australia. [http://www.dse.vic.gov.au/\\_data/assets/pdf\\_file/0020/101288/Research\\_Report\\_55.pdf](http://www.dse.vic.gov.au/_data/assets/pdf_file/0020/101288/Research_Report_55.pdf)

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## 11 Recommended Reading

**Coastal Fire Centre. Guide to Rating Fuel Loading and Fire Hazard & Risk Assessment**

[http://bcwildfire.ca/Industry\\_Stakeholders/Industry/Guide%20to%20Rating%20Fuel%20Loading%202012.pdf](http://bcwildfire.ca/Industry_Stakeholders/Industry/Guide%20to%20Rating%20Fuel%20Loading%202012.pdf)

**Forest Practices Board – Fire Related Reports**

<http://www.fpb.gov.bc.ca/>

- Post-Wildfire Hazard Assessment and Risk Management – Feb 2006;
- Managing Forest Fuels – June 2006; Managing Forest Fuels in the Wildland Urban Interface – Feb 2010;
- Fire Preparedness – Feb 2011; Fire Management Planning – Feb 2012;
- Interim Report: Special Investigation of Fire Hazard Assessment and Abatement” Forest Practices Board – July 2007.

**The Home Owners FireSmart Manual – BC Edition**

<http://embc.gov.bc.ca/ofc/interface/pdf/homeowner-firesmart.pdf>

## 12 Appendix A - Purpose and Scope of Guidelines

With its inception, the FFMTF was specifically tasked to complete the following:

- Identify the scope of specific professional practice and stewardship issues relating to fire and fuels management;
- Prioritize, by importance and urgency, the identified issues; and
- Recommend action for the ABCFP to take on each issue.

The FFMTF identified and organized professional practice issues into three categories: (1) Regulatory; (2) Practice; and (3) Other.

Regulatory issues were associated with various pieces of provincial legislation, local government bylaws, and policies that impact fire and fuels management. Specifically, the main regulatory issue was conflicts that may exist between current legislation and bylaws with regards to fire and fuels management. These conflicts may increase fire hazards or may be inconsistent with fire and fuels management objectives. Furthermore, it was identified that professionals may be working beyond their scope of practice when undertaking work in fire and fuels management.

Practice issues highlighted the lack of continuing education, professional guidance and research information with regards to fire and fuels management. The resultant effect of the above is the limited number of available and competent professionals, non-members practising in the field, and a lack of standards expected of a forest professional in fire and fuels management.

'Other' issues included the risk to public safety, lack of appropriate funding, liability, and a general concern for the lack of coordination between fire and fuels management plans and landscape level forest plans.

## 13 Appendix B - Priority Issues Identified by the FFMTF

From the list of seven issues, the FFMTF developed a priority list of the top four concerns. For each of these concerns, the task force identified the issue, developed some background on the issue, and summarized FFMTF discussion. Additionally, options to address the issue were also provided. The list below contains the top four concerns identified in the FFMTF discussion (Fire and Fuels Management Report, April 2012):

1. Standards of Professional Practice
  - Issue: Professional standards and guidance available for forest professionals practising in the areas of fire and fuels management are limited.
2. Definitions – fire hazard, fire hazard assessment, fire hazard abatement
  - Issue: While various definitions are available, there exists no clear, commonly understood and accepted definition for fire hazard in British Columbia. Therefore, the terms ‘fire hazard assessment’ and ‘fire hazard abatement’ also lack clear, commonly understood and accepted definitions.
3. Coordinated Landscape Planning and Multiple Objectives
  - Issue: Fire and fuels management activities may not be included in planning processes and documents and, at times, may occur in isolation or with limited consideration for other resource objectives.
4. Education – internal (member training)
  - Issue: The general ABCFP membership has limited expertise in relation to fire and fuels management and there is a need for members to develop and maintain competence in this regard. This issue relates to the need for practice standards or guidance because the lack of standards or guidance makes it difficult to identify educational gaps and conversely, gaps in education make it difficult for members to competently meet practice standards or guidance. Action on this issue will help to address the competency aspect of issue #1, and action on issue #1 will contribute to addressing this issue of member education.

The final recommendation from the PPC to the ABCFP was to implement the actions outlined in the FFMTF document on the top four priorities. This paper is a direct action on behalf of the ABCFP to meet this recommendation from the PPC for the top three priorities.



330-321 Water Street  
Vancouver, BC V6B 1B8  
Tel: 604.687.8027 Fax: 604.687.3264  
E-mail: [info@abcfp.ca](mailto:info@abcfp.ca)  
Website: [www.abcfp.ca](http://www.abcfp.ca)

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