# FLAT TOP COMPLEX

Final Report from the

## Flat Top Complex Wildfire Review Committee

Submitted to the
Minister of Environment and Sustainable Resource Development

MAY 2012

ISBN No. 978-1-4601-0270-1 (Printed Edition)

ISBN No. 978-1-4601-0273-2 (On-line Edition)

Pub No. T/272

*Notes:*

Subsequent to the completion of this report, the departments of Sustainable Resource Development and Environment and Water were amalgamated. The combined department is known as Environment and Sustainable Resource Development.

The numbers in this report were based on information available at the time the report was prepared and may be subject to change.

## Dedication

This report is dedicated to those who bravely risk their lives to fight wildfires that threaten Albertans, their communities, and natural resources. Those who respond to wildfires including Government of Alberta staff, local fire departments, contractors and others, carry out difficult and dangerous work.

We particularly remember pilot Jean-Luc Deba of Montreal, who lost his life on May 20, 2011, while working on the Flat Top Complex.

The report is also dedicated to those whose lives were impacted by the 2011 wildfires. Their resilience and determination to recover from their loss is truly inspirational.

Photo: Wildfires SWF-056 (far left) and SWF-065 (centre) on May 15, 2011

(Cover Photo: Town of Slave Lake/Wildfire SWF-065 – May 15, 2011)

## Message from the Committee

*"Learn the past, watch the present, and create the future."*
- Anonymous

Adversity can be a cruel teacher; however, adversity creates an opportunity to learn, and learning is the catalyst that inspires people to evolve and adapt to new opportunities, threats and realities.

Alberta's wildfire management program resides within the Forestry Division of Alberta Sustainable Resource Development. The province has a reputation for building a progressive, responsive and highly professional wildfire management program based on a commitment to continually assess its performance and identify opportunities for adaptation and improvement.

The Minister of Sustainable Resource Development created the Flat Top Complex Wildfire Review Committee to assess Alberta's wildfire management program with a focus on the department's response to the wildfires that entered the Town of Slave Lake and nearby communities of Poplar Estates, Canyon Creek, and Widewater in May, 2011. The establishment of this Committee follows the department's commitment to continuous learning and improvement.

The Committee had the opportunity to hear from stakeholders, and wildfire science and firefighting experts. We were touched by the personal accounts shared with us by those whose lives were profoundly affected by the wildfires. We were impressed with the tenacity and bravery of responders, who fought these wildfires on the ground and in the air. Some of these dedicated women and men's homes were also damaged or destroyed by the wildfires.

We are grateful to everyone who met with us and generously shared their time, experiences, and expertise. We sincerely hope that this report and our recommendations will have a positive impact on Alberta's wildfire management program, and represent the best interests of Albertans.

Bill Sweeney, Chair
Flat Top Complex Wildfire Review Committee

# EXECUTIVE SUMMARY

More Albertans are choosing to live, work, and play throughout the forested regions of the province, with investment and activity in Alberta's wildlands accelerating. Experts say that climate change is increasing the wildfire threat, some aspects of which are already measureable with longer fire seasons and more extreme weather. Aging coniferous forests dominate more of the landscape, which means Alberta's forests are likely more flammable than they were even 50 years ago. As a result, the risk of wildfires, and the threat they pose to lives, homes, communities, and industry is increasing. Public expectations for personal safety and the security of their property are also heightened, at the same time that budgets for public services are constrained. These factors challenge wildfire management organizations around the world.

In recent history, Alberta has experienced very few losses of homes due to wildfires within the Forest Protection Area. Prior to 2011, the last wildfire causing widespread damage to a community was in 1919 when the Town of Lac La Biche was destroyed, and 14 people lost their lives. Since 1919, and prior to the 2011 wildfires in the Slave Lake area, the most significant losses were experienced in 2001 when a wildfire destroyed 10 homes in the hamlet of Chisholm.

In 2011, in addition to the historic personal loss from wildfires in Alberta, the economic impact was substantial. Statistics Canada cited the wildfires as a key contributor to the contraction of the Canadian economy, and the direct impact on the oil and gas industry alone was conservatively estimated at over $300 million. The forest industry was also affected, with over 12,000 hectares of reforested cutblocks and a total of over 790,000 hectares of forested land burned.

During the week of May 8, 2011, Sustainable Resource Development recognized the potential for extreme wildfire behaviour (given the forecasted wind conditions) and the threat of new wildfires across the province. On May 13, the Provincial Forest Fire Centre issued a Fire Weather Advisory in the Forest Protection Area for areas east of the fifth meridian (about 100 kilometres east of the Town of Slave Lake). This Advisory continued through to May 15 when it was extended to areas that included the Slave Lake area. Sustainable Resource Development's Provincial Forest Fire Centre and Area offices took actions based on provincial priorities, the department's standard operating procedures, and their Presuppression Preparedness System.

From May 11 to 15, 2011, Sustainable Resource Development fought 189 wildfires that ignited across Alberta and threatened over 23 communities/locations. All provincial wildfires during that period were human-caused. Of those wildfires, 52 occurred in the Lesser Slave Area (one of 11 Sustainable Resource Development regional locations). While it is true that wildfires are an expected and natural occurrence in the boreal forest, there was much that was unexpected and unpredictable about some of these wildfires.

Strong, sustained winds from the southeast added to the suppression challenges on many wildfires. On May 15, 2011, one of the wildfires entered the Town of Slave Lake and destroyed 428 single-family dwellings, seven multi-family residences, and 19 non-residential buildings. A second wildfire burned towards residential developments along the south shore of Slave Lake. In addition to the structures destroyed within the Town of Slave Lake, these two wildfires destroyed 56 single-family

dwellings in nearby communities (Canyon Creek, Widewater and Poplar Estates) within the Municipal District of Lesser Slave River. The two wildfires also resulted in the evacuation of almost 15,000 residents. A third threatening wildfire occurred north of the Town of Slave Lake on May 15, but did not burn any structures. These three wildfires were known as the "Flat Top Complex".

Sustainable Resource Development uses the word "complex" to describe a series of related wildfire events that are managed by a specific Incident Management Team. These specialized teams are deployed when wildfires present particularly difficult suppression challenges or pose a significant threat to the safety of people and their property. The two main wildfires in the Flat Top Complex were assigned the numbering designations of SWF-056 and SWF-065, and the third was assigned SWF-082.

When wildfires SWF-056 and SWF-065 started, the department dispatched one of its qualified and experienced Type 1 Incident Management Teams to the Lesser Slave Area to assume direct responsibility for Sustainable Resource Development's Flat Top Complex operations. SWF-056 started about 25 kilometres from Lesser Slave Lake's south shore communities, spread quickly and, within approximately 31 hours of detection, it reached Canyon Creek and Widewater, narrowly missing the villages of Wagner and Assineau. On May 14, SWF-065 started approximately eight kilometres from Slave Lake and burned into the rural subdivision of Poplar Estates that evening. The next morning, as a result of significant overnight firefighting and improved weather conditions, the wildfire did not spread. However, as weather conditions intensified SWF-065 rapidly developed on the afternoon of May 15 and spread from its front in and around Poplar Estates, threatened the Sawridge First Nation and eventually breached the Town of Slave Lake's municipal boundaries, all within approximately 24 hours of detection.

By the time SWF-056 and SWF-065 were finally extinguished, they would, in the Canadian context, cause unprecedented losses. Nearly 22,000 hectares were burned, and there was considerable damage to property, disruption to commerce in the region, and long-lasting impacts to thousands of local residents. Personal possessions were lost, along with the sense of security that the threat of wildfire would be kept outside of communities. The real depth and breadth of the impacts will likely not be fully appreciated for many years. Although there was no loss of life during the main passage of these wildfires, one helicopter pilot lost his life on May 20 when he was working on the Flat Top Complex.

In recognition of the significance of these wildfires, the Minister of Sustainable Resource Development established the Flat Top Complex Wildfire Review Committee in June 2011 to review the department's efforts before, during, and after the wildfires. The Committee spent considerable time validating information, as there were various rumours regarding the Flat Top Complex. The Committee met with key stakeholders and staff, and heard from experts in wildfire science and operations.

The Committee was informed that the wildfire behaviour became extreme on May 15 due to extraordinary and sustained wind conditions. The Committee heard of the professionalism, bravery, and initiative displayed by the Lesser Slave River Regional Fire Service and Sustainable Resource Development firefighters on the ground and in the air. Their actions helped prevent SWF-065 from developing a broad front as it spread towards the Town of Slave Lake.

Individuals, other Government of Alberta Ministries and a number of organizations, including the Municipal District of Lesser Slave River, the Town of Slave Lake, and the RCMP, were also challenged by this extraordinary event and responded with determination and commitment. Additionally, the public responded with significant cooperation and resolve to work with authorities and, on their own initiative, to help protect themselves and others from the wildfires. Collectively, they faced extremely dangerous conditions, quickly adapted to the situation, and undoubtedly saved homes and other property.

The Committee recognized that Sustainable Resource Development has made significant progress in many areas of wildfire management over the past decades (in part as follow up to the 1998 Alberta Fire Review (KPMG) and 2001 Chisholm Fire Review Committee reports). It was also clear that Sustainable Resource Development placed a high priority on implementing lessons learned from 2011 and initiated changes as a result of feedback from staff reviews, within the limitations of current resources and finances.

Based on the input from stakeholders, wildfire experts and Sustainable Resource Development staff, and in consideration of challenges expected in future years, the Committee noted opportunities for improvement and categorized those findings within seven themes:

1. *Wildfire Prevention*
   Various actions were taken to reduce fuel loading in the Slave Lake area prior to the Flat Top Complex, however, more could have been done. Considering the rapidly increasing number and severity of wildfires in Alberta, there is the need to increase wildfire prevention initiatives. The Committee commends Sustainable Resource Development for its efforts in building FireSmart into a broadly accepted program (that is being implemented provincially, nationally, and internationally); however, the department should not be the sole carrier of the program. The Committee believes that other ministries, municipalities, and partners need to be engaged to improve the program's effectiveness.

2. *Preparedness and Capacity*
   Sustainable Resource Development's strategic approach to wildfire preparedness is a 'high state' of readiness, which means being prepared to respond promptly to wildfires and the threat of wildfires in order to minimize losses. In 2003, this approach was reviewed and supported by external experts. The Committee also supports this approach.

   Although Alberta has provided reasonable funding for wildfire management resources, that budget is continuing to be eroded by increasing operational costs and an expanding wildfire management workload of approximately 5+% per year. Sustainable Resource Development has adapted by contracting out wildfire crews, shortening terms for in-house crews, and periodically utilizing staff from other programs within the department (e.g., Forest Management, Fish and Wildlife, Lands). There are specific areas where wildfire management capacity should be improved, including development of in-house expanded attack crews, advancing the start dates for firefighting resources (manpower and aircraft), and enhancing access to retired staff that have current expertise.

A very positive element highlighted by the 2011 fire season was the rapid deployment of "structural protection systems" (sprinklers) used to protect homes and buildings. This approach has been developed with Sustainable Resource Development and its partner agencies across Canada. The challenge that arises during extreme and widespread wildfire events is deployment of sprinklers becomes a drain on resources needed to contain wildfires.

3. *Communications*

   Incident communications were challenged by the extreme events of 2011. While communication to the public during the peak of wildfire activity was greatly enhanced by the use of social networking (i.e., Facebook, Twitter), the Committee heard that a number of stakeholders were not adequately informed regarding potential impacts of the forecasted weather. The messages prior to May 14 related to the wildfire hazard and fire permit management, but did not include information about potential greater risks (e.g., personal health and safety) or evacuation plans. Sustainable Resource Development's Fire Weather Advisory did not include wildfire behaviour information, which could have helped local authorities and the public make informed decisions. Communication within Sustainable Resource Development and among responding agencies, at times, lacked planning and clarity and was limited by a variety of factors (overloaded radio systems, power outages, loss of cell phone coverage, texting restrictions).

4. *Organization and Incident Management*

   In emergency situations, clear, concise lines of authority are critical. Additionally, all participants must be capable of adapting quickly and seamlessly into a local emergency response framework, particularly during wildland urban interface wildfires. Sustainable Resource Development's current organizational structure does not facilitate clear lines of authority for wildfire operations. In addition, there have not been sufficient regional emergency preparedness exercises with other ministries and agencies to ensure all emergency responders have built the relationships and communication protocols that will withstand the extraordinary challenges during an emergency or disaster.

5. *Post-wildfire Business Resumption*

   Rapid return of government services is challenging in such situations and requires consideration of public needs, staff, and infrastructure. This is especially true for wildfire operations during the fire season. Many things were done well to support staff and return service as needed. There were also things that were learned that should be applied in future events. Government agencies need to be coordinated in providing post-incident support.

6. *Policy and Legislation*

   Sustainable Resource Development staff performed their roles within their understanding of their responsibilities. In some cases, the policy/legislation that supports those roles needs updating; in other cases there is a need for clarification, communication, and/or additional training.

7. *Research and Development*
   Given the precedent-setting nature of the Flat Top Complex, there is a significant opportunity to learn. This new knowledge, and the improvements that will be created from it, will be critical to prepare for wildfire events that many predict will be similar or more challenging.

The following summarizes recommendations made by the Committee in relation to each of the seven themes. This report does not deal with issues regarding the cause of the wildfires, nor does it address issues that are the responsibility of other agencies, organizations or individuals, except where they directly affect the ability of Sustainable Resource Development to fulfill its mandate.

## SUMMARY OF RECOMMENDATIONS

| Theme | Recommendations |
|---|---|
| *Wildfire Prevention* | 1. Implement significant enhancements to wildfire prevention measures, including widespread fire bans, forest area closures, fire permit management, and elevated fines during extreme weather and/or wildfire behaviour conditions. Special consideration should be given to prevention activities early in the fire season. In addition, Sustainable Resource Development should enhance communications of these initiatives to stakeholders and the public to gain their support and acceptance. |
| | 2. Enhance wildfire prevention measures to aggressively address the increase in human-caused wildfires. Evaluate the effectiveness and future use of limited liability (as currently expressed in industry fire control agreements) to facilitate effective wildfire prevention by industries operating within the Forest Protection Area. |
| | 3. Establish a revised delivery model for a FireSmart program under one provincial framework, including a streamlined and enhanced funding model. |
| | 4. Accelerate fuel management treatments near communities in forested areas that are at risk from wildfires. Priority should be given to thinning or conversion of coniferous stands, particularly black spruce, which threaten community developments (as identified through strategic analysis of wildfire threat potential). |
| *Preparedness and Capacity* | 5. Advance start times for resources, including crews, equipment and aircraft contracts, to be fully ready for potential early fire seasons. Ensure staff vacancies are filled as soon as possible. Expand work terms to year round for a portion of firefighting crews to support retention and provide capacity for FireSmart initiatives. |

| Theme | Recommendations |
|---|---|
| *Preparedness and Capacity continued* | 6. Develop in-house expanded attack firefighting crews to provide sustained action capability and other wildfire management functions (modeled after the United States Hot Shot crews and/or British Columbia Unit Crews). These crews will enhance response capability on complicated and difficult wildfires. When not fighting wildfires, these crews can be made available for fuel management and landscape FireSmart activities. |
| | 7. Ensure sufficient fire behaviour specialist capabilities at Sustainable Resource Development's Provincial Forest Fire Centre as part of wildfire weather forecasting, and implement wildfire occurrence predictions to support the Presuppression Preparedness System. |
| | 8. Initiate resource requests in advance of potential demand, especially in anticipation of extreme wildfire risk conditions.<br>Efforts should be made to reduce delays inherent in the resource request and sharing system internally and with other agencies. |
| | 9. Work with other agencies (e.g., Alberta Municipal Affairs) to develop a structure protection program in which Sustainable Resource Development's role in structural protection is reduced. This will allow Sustainable Resource Development to focus its resources and actions on wildfire containment.<br>The intended result is an increased role for municipal fire services to provide sprinkler protection for homes. Key components will be the provision of standardized equipment and training for fire departments and focus on proactive deployment under the mutual aid network. |
| *Communications* | 10. Enhance standards and training for employees involved in liaison and wildfire management information communications that support operations before, during and after a wildfire event. |
| | 11. Issue Fire Weather Advisories that include wildfire behaviour potential to ensure understanding of the wildfire danger.<br>Fire Weather Advisories should be more comprehensive in terms of distribution to staff, stakeholders and the public, and more interpretive in terms of implications (i.e., what does the information mean and what actions need to be taken). Fire Weather Advisories are a relatively rare event, which makes it even more important that their meaning is easily understood. Stakeholders and the public need to understand that wildfires can start more easily in certain conditions and, if they do start, can spread very quickly. |

| Theme | Recommendations |
|---|---|
| *Communications continued* | 12. Undertake a review of Sustainable Resource Development's dispatch and resource tracking systems.<br><br>The Committee believes economies of scale and efficiencies in dispatch and tracking aircraft can be achieved through investment in improved dispatch approaches and technology. Sustainable Resource Development should determine whether other provincially-based emergency and wildfire dispatch methodologies and standards (including training) would be beneficial to its operations. |
| | 13. Enhance communication by fully supporting alternative communication technologies (texting, social networking). |
| *Organization and Incident Management* | 14. Realign Area wildfire operations to a direct line reporting relationship within Sustainable Resource Development's Forestry Division to provide clearer responsibilities and authorities. |
| | 15. Restore regular internal assessments of Provincial and Area implementation of wildfire management strategies, priorities and procedures. Undertake regular reviews and benchmarking of Sustainable Resource Development's wildfire management strategies and firefighting priorities. |
| | 16. Work with the Alberta Emergency Management Agency to align implementation of the Incident Command System and the use of Incident Management Teams under a consistent provincial model.<br><br>This should include development of appropriate training and emergency simulation exercises that are practised regularly (from tabletop to full simulation exercises related to wildfires). |
| *Post-wildfire Business Resumption* | 17. Review Sustainable Resource Development's business continuity plans in the context of overall Government of Alberta plans, with particular attention to loss of department infrastructure and support to staff. |
| *Policy, Procedures and Legislation* | 18. Undertake a comprehensive review of Sustainable Resource Development's wildfire policies and associated procedures, especially with regard to priorities, structural firefighting, initial attack, and night-time firefighting, with consideration of staff training and understanding, to ensure consistent interpretation of policies and procedures. |
| | 19. Work with legal counsel to review and update the ministry's *Forest and Prairie Protection Act* and associated regulations, in context with other applicable legislation, with particular attention to key areas including, but not limited to agency roles and responsibilities (such as *Forest and Prairie Protection Act* Section 7), evacuation authorities, wildfire investigation, fire control authorizations, administrative penalties, as well as updating definitions. |

| Theme | Recommendations |
|---|---|
| *Research and Development* | 20. Collaborate with research agencies to support research, development and monitoring in key areas highlighted by the Flat Top Complex including, but not limited to the following:<br>• Factors contributing to wildfire threat and structure losses, including wildland and other fuels, social elements, and the contribution of black spruce as a source of extreme wildfire behaviour and spotting;<br>• Community planning and development, including codes and standards that impact building materials and fuels in the community;<br>• Effectiveness and efficiency of FireSmart treatments and decision support tools for FireSmart investments;<br>• Public awareness regarding the potential risk from wildfires and best practices to mitigate this risk, and factors affecting community and resident decisions to implement wildfire risk mitigation activities;<br>• Enhanced fuel characterization to provide improved fire behaviour forecasting; and<br>• Prediction of wind events, including approaches for worst case probability modeling, in collaboration with Environment Canada; apply lessons learned to forecasting. |
| | 21. Enhance the Presuppression Preparedness System to account for new information from 2011 related to initial and expanded attack requirements, with consideration of the potential use of wildfire occurrence prediction. |

Of the recommendations contained in this report, some can be achieved within Sustainable Resource Development's authority and budget, but others require enhanced investment, Government of Alberta support, and the cooperation of other ministries, levels of government, stakeholders, and the public. For example, in the case of funding for FireSmart in communities, investment will need to be new, substantial, and sustained. The Committee feels this investment is essential due to the increasing threat of wildfires to public safety and communities, and the reality that wildfires can directly inflict many hundreds of millions in property and economic damage in any given year.

The elimination of wildfire risks is unreasonable and unattainable, however, effective wildfire management initiatives can significantly reduce the risk. The Committee believes the recommendations in this report are both reasonable and attainable and will enhance Alberta's wildfire management program. The Committee's advice is based on the best available information. The Committee recognizes that some of the recommendations will require time and on-going commitments. Implementation of the recommendations will also require refinement and adjustment as more becomes known.

The Committee acknowledges that some of the recommendations are beyond Sustainable Resource Development's authority and ability to implement unilaterally. The Committee believes that government, fire control organizations (structural and wildfire), industry, and individual Albertans should take measures to recognize, prepare for, mitigate, and respond to wildfire risks. The Committee concludes that a collaborative approach has considerable potential to strengthen Alberta's resilience to the threat of wildfire. Collaboration should be an underlying principle to the future state of wildfire management in Alberta.

As to whether the Flat Top Complex should have been fought differently, the Committee heard comments on both sides of the argument. The Committee considered factors such as available resources, and wildfire activity, behaviour, and conditions. The Committee was not convinced that different firefighting tactics could have been implemented with the available resources, which would have guaranteed an improved outcome while not seriously compromising firefighter safety.

The Committee considers the Flat Top Complex as the strongest warning to date that expanded residential and industrial development in Alberta's wildlands, in combination with increasingly severe wildfire conditions, requires increased focus and collaboration to minimize risk to health and safety, and reduce damages and losses. The Committee recognizes that research and knowledge will allow wildfire management organizations to adapt to future threats and realities. Sustainable Resource Development must continue to be adaptive, ensuring continuous learning and adjustments to its wildfire management programs as new information becomes available. The result will be a safer and more secure Alberta, better able to withstand extremes of future wildfire conditions, thereby minimizing devastating social and economic impacts.

# TABLE OF CONTENTS

# LIST OF FIGURES



# LIST OF TABLES

# FLAT TOP COMPLEX WILDFIRE REVIEW

## Flat Top Complex Wildfire Review Committee

The Minister of Sustainable Resource Development initiated a review of the department's role in three wildfires in the Slave Lake area (the Flat Top Complex) in order to identify opportunities for improvement. A key tenet of the need for this review was that this event raised the bar for wildfire management, as well as public expectations. The mandate of the Committee was to:

- *Review Sustainable Resource Development's wildfire management program and budget, relevant policies and legislation.*
- *Assess information on the wildfire conditions and behaviour for the Flat Top Complex, and the encroachment of wildfire into nearby communities.*
- *Conduct a comprehensive evaluation of Sustainable Resource Development's wildfire operations for the Flat Top Complex.*
- *Assess Sustainable Resource Development's response to the Chisholm Fire Review Committee Final Report dated October 2001.*
- *Make recommendations to the Minister of Sustainable Resource Development on how the department can improve its wildfire management program.*
- *Engage with Alberta government staff, external experts and relevant stakeholders.*
- *Provide a report to the Minister of Sustainable Resource Development with recommendations consistent with the Committee's Terms of Reference.*

*The Committee's mandate did not include determining cause of the wildfires or affixing culpability.*

## Review Process

The Committee established a review process that included:

- Reviewing applicable documentation and legislation
- Meetings and focus group sessions with:
    - Alberta government staff
    - External experts
    - Relevant stakeholders as defined by the Government of Alberta
- Considering written submissions from a variety of affected stakeholders

Sustainable Resource Development also established a Documentation and Technical Support Team of internal and external wildfire experts, to compile and summarize the extensive information related to the Flat Top Complex, and provide support and technical advice to the Committee.

During and following this wildfire event, rumours circulated that contributed to feelings of frustration and anxiety that were expressed to the Committee at meetings and focus group sessions. Through those conversations, and with the assistance of documented information, the Committee developed a clearer understanding of the events that occurred before, during, and after the Flat Top Complex.

The Committee met with 40 Sustainable Resource Development staff and 52 external experts and stakeholders representing the Town of Slave Lake, Municipal District of Lesser Slave River, First Nations, emergency responders, local business owners, industry, and contractors. Additionally, the Committee received 17 written submissions from stakeholders who provided input on Sustainable Resource Development's actions related to the Flat Top Complex.

## IDENTIFIED THEMES

Through the process of gathering input and information, a number of themes appeared repeatedly. The Committee categorized its findings as follows:

1. **Wildfire Prevention**
2. **Preparedness and Capacity**
3. **Communications**
4. **Organization and Incident Management**
5. **Post-wildfire Business Resumption**
6. **Policy, Procedures and Legislation**
7. **Research and Development**

# FLAT TOP COMPLEX

The 2011 fire season in central Alberta developed quickly following snowmelt in early May. Within days, 189 human-caused wildfires ignited across the province and threatened over 23 communities/locations (e.g., camps, worksites, parks, wildfire lookouts). Strong, sustained winds from the southeast created wildfire suppression challenges. When initial attack and sustained attack resources were fully committed, Sustainable Resource Development requested additional national and international resources. The Lesser Slave Area, one of the 11 Sustainable Resource Development regional Areas (10 of which are in the Forest Protection Area), was the most active in terms of wildfire activity, with 52 wildfires and several communities threatened. Three of the wildfires in the Lesser Slave Area were identified as the "Flat Top Complex".

Sustainable Resource Development uses the word "complex" to describe a series of related wildfire events that are managed by a specific Incident Management Team. These specialized teams are deployed when wildfires present particularly difficult suppression challenges, or pose a significant threat to the safety of people and their property. The two main wildfires in the Flat Top Complex were assigned the numbering designations of SWF-056 and SWF-065, and the third was assigned SWF-082. The total number of wildfire suppression resources used by Sustainable Resource Development on the Flat Top Complex included:

- **Manpower**: 8 wildfire crews from Alberta (a total of 48 individuals), and 11 wildfire crews from British Columbia (a total of 220 individuals)
- **Aircraft**: 15 airtankers, 10 fixed wing aircraft, and 34 helicopters
- **Heavy equipment**: 66 pieces (33 bulldozers, 17 all terrain vehicle water tanks - skidders/nodwells, 11 excavators, 2 feller bunchers, and 3 skidders)
- **Water trucks**: 15

These numbers represent the total wildfire suppression resources that were deployed for various lengths of time on the Flat Top Complex.

Wildfires SWF-056 and SWF-065 resulted in the loss of approximately 510 structures (i.e., single-family dwellings, multiple-family dwellings and non-residential buildings) in the Town of Slave Lake and nearby communities of Canyon Creek, Widewater, and Poplar Estates. The majority of damage at the community level occurred within approximately 31 hours of ignition of the two wildfires. The estimated insured losses exceeded $700 million, which is three times the value of the previous record setting losses experienced in British Columbia during the 2003 fire season. The third wildfire (SWF-082) did not result in any structure loss.

## Overview of Operations

A week before the wildfires of the Flat Top Complex started, the fire danger rating was low; however, the level increased as the week progressed. The Committee took specific note of the following significant wildfire operations related to the Flat Top Complex (specific details of wildfire conditions and operations on a day-by-day basis are provided in the Flat Top Complex Wildfire Science and Wildfire Operations Documentation reports):

**May 12** Sustainable Resource Development's Provincial Forest Fire Centre became aware that conditions were rapidly changing from pre-season to full spring conditions, and weather conditions were developing that would result in broad-scale, major winds.

**May 13** The Provincial Forest Fire Centre issued a Fire Weather Advisory for areas east of the fifth meridian (about 100 kilometres east of the Town of Slave Lake). The Advisory identified forecasted sustained winds of 40 kilometres per hour, gusting to 60 kilometres per hour. The Advisory was sent to Sustainable Resource Development Areas. The information was also sent to an extensive stakeholder list. In Lesser Slave Area, suspension of fire permits was initiated through public and stakeholder notification, and no new permits were issued.

**May 14** The Fire Weather Advisory continued for areas east of the fifth meridian.

Wildfire SWF-056 was discovered at 13:25 burning in a recently harvested cutblock about 25 kilometres southeast of the south shore communities of Widewater, Canyon Creek, and Wagner. Fine fuels in the cutblock and dead balsam fir in the mixedwood forest (coniferous and deciduous) supported rapid wildfire spread upslope to the northwest. Initial attack resources (manpower, equipment and aircraft) responded during the afternoon and evening.

Wildfire SWF-065 was detected at 17:50 and was burning in mature black spruce, approximately eight kilometres southeast of the Town of Slave Lake, within the Municipal District of Lesser Slave River. Initial attack was undertaken by the Lesser Slave Regional Fire Service. Sustainable Resource Development provided aircraft, ground crews, and equipment. The wildfire crowned almost immediately under the influence of strong southeast winds, spread quickly to the northwest, and spotted into Poplar Estates within an hour of ignition.

Sustainable Resource Development activated an Incident Management Team which arrived in Slave Lake that evening.

**May 14 continued**

Overnight, Sustainable Resource Development ground resources (firefighters and heavy equipment operators) worked in coordination with Lesser Slave River Regional Fire Service on wildfires SWF-056 and SWF-065. The resources focused on protecting structures under direct threat by SWF-065, attempted to achieve containment around the SWF-065 perimeter, and set up structural protection systems ahead of SWF-056.

**May 15**

Sustainable Resource Development Provincial Forest Fire Centre extended the Fire Weather Advisory to east of the sixth meridian (about 200 kilometres west of the Town of Slave Lake).

On the morning of May 15, SWF-056 behaved like a typical high-intensity spring wildfire in Alberta's boreal mixedwood forests. At that time, this wildfire was more active than SWF-065 and was a threat to south shore communities. SWF-056 was spread by strong winds and extensive spotting. Evacuation orders were issued for the south shore communities at approximately 12:36. Dozer crews with air support worked until 14:30 when conditions became unsafe due to erratic wildfire behaviour, and suppression operations were suspended. Sustainable Resource Development used a fire growth model, which predicted SWF-056 would reach the south shore communities at about 19:30. The wildfire crossed the highway at 20:23 and subsequently entered Widewater and Canyon Creek.

By the morning of May 15, SWF-065 had caused significant damage to a number of homes and outbuildings in Poplar Estates. Due to overnight firefighting and improved weather conditions, the wildfire was not actively spreading. However, by early afternoon extreme winds caused SWF-065 to rapidly develop. Embers from the wildfire were blown into fuels along the highway. The wildfire then headed toward the Town of Slave Lake. Air attack efforts to steer the wildfire past town may have had some impact, but the effect appeared to have been limited, due to the strength of the ground level winds. After air support was grounded at approximately 16:00 due to dangerous wind conditions, the wildfire spread quickly through harvest debris on private land and through black spruce. Extremely high winds and downwind spotting resulted in the wildfire approaching the Town of Slave Lake as residents evacuated from the area. Embers began igniting structures in the Town of Slave Lake before the wildfire reached Highway 88 at approximately 17:25.

SWF-082 was detected at 15:50 and was a potential threat to well sites, as well as the Marten Mountain Wildfire Lookout. This wildfire was extinguished before any structures burned.

**May 16 to extinguishment**

Sustainable Resource Development's wildfire suppression resources continued to work on the Flat Top Complex to contain and extinguish the three wildfires. After May 18, there was no significant growth in the perimeters on any of the three wildfires.

Photo: SWF-065 (in the forefront) on May 15 burning through a black spruce stand

## Overview of Conditions that Affected Wildfire Behaviour

Wildfire behaviour is influenced by several factors, including weather conditions, the type of vegetation or other fuels, and topography. The key environmental factors that affected wildfire behaviour and suppression operations on the Flat Top Complex were fuel and weather conditions, with topography playing a lesser, but still significant role.

### FUEL

The three wildfires were most intense when burning in coniferous fuels (lodgepole pine, black spruce, white spruce, and balsam fir). The general condition of the larger sized fuels was not particularly dry; whereas the dead, fine fuels were dry and contributed significantly to wildfire spread. Fuel factors that contributed to wildfire behaviour included:

- Low moisture in fine fuels immediately after the snow was gone
- Continuous black spruce forests and dead balsam fir in mixedwood (coniferous/ deciduous) forests
- Continuous fine fuels in the cutblock, forests, along driveways, fence lines and railway rights of way
- Debris piles from previous land clearing on private land adjacent to Highway 2
- Large amounts of combustibles such as structures, vehicles, fuel tanks, holiday trailers, wood piles

It is well known that, until grass fuels "green up" with new growth, the previous year's dead grass supports wildfire spread. Potentially of more concern was the condition of the live trees, especially the conifers, as they are subject to a condition known as "spring foliar moisture deficit". Studies have shown that needles of conifers undergo a period of reduced moisture content (as a percent of overall needle mass) during the spring period when the needles become active before roots are warm enough to transport moisture. There are opinions, although not scientifically documented, that extreme warm, dry winds can exacerbate this condition, especially in black spruce.

### WIND

During the second week of May (May 11 – 15), part of the province was subjected to sustained and extreme winds, gusting above 80 kilometres per hour. On the Flat Top Complex, this resulted in a flattened, wind-driven wildfire front, which rapidly carried sparks downwind. These sparks were the primary means by which SWF-056 and SWF-065 breached the communities' borders and ignited structures. In addition, the strong winds and low-level smoke complicated wildfire control efforts and made monitoring of wildfire progress difficult, thereby threatening the safety of the public, Sustainable Resource Development wildfire resources, and other emergency responders. The highest wind speed recorded during the Flat Top Complex wildfire event was on May 15. On that day, a wind speed of 114 kilometres per hour was recorded at the Deer Mountain Lookout (about 12 kilometres south of the Town of Slave Lake).

#### TOPOGRAPHY

On SWF-056, upslope conditions prevailed from the origin of the wildfire to the top of Grizzly Ridge. The smoke column followed the slope, obscuring the head of the wildfire. The topography funnelled winds and accelerated wind velocities on SWF-065. In addition, at times on both wildfires, terrain and poor visibility from smoke resulted in airtankers dropping retardant at higher altitudes than they would normally drop at under more favourable conditions, thereby reducing the effectiveness of the retardant.

## Summary of Impacts

The wildfires in 2011 demonstrated that wildfires are a real threat to people's lives and livelihoods. Considering the wildfire conditions and property damage, it is remarkable that no one was seriously injured or killed during the peak of the event. The subsequent fatality of a pilot working on the Flat Top Complex is a tragic reminder of the ultimate risks that firefighters face in their efforts to protect human lives, communities, and forest resources from wildfires.

The net result of the Flat Top Complex was intense destruction of the property of residents and businesses in Slave Lake, Poplar Estates, Widewater, and Canyon Creek, and significant impacts to industry and infrastructure in the vicinity.

- SWF-056 burned approximately 17,000 hectares.
- SWF-056 and SWF-065 destroyed a total of 56 single-family dwellings in the Municipal District of Lesser Slave River in the communities of Widewater, Canyon Creek and Poplar Estates.
- SWF-065 burned approximately 5,000 hectares. This wildfire destroyed 428 single-family dwellings, 7 multi-family residences, and 19 non-residential buildings in the Town of Slave Lake. The public library, town hall, and the town and provincial government office building were destroyed.
- SWF-082 was a potential threat to infrastructure. It burned over 400 hectares and was contained before the values at risk were in imminent danger.
- Almost 15,000 residents of the Town of Slave Lake, Municipal District of Lesser Slave River, and Sawridge First Nation were evacuated for about 2 weeks.
- Sustainable Resource Development's wildfire suppression costs totalled approximately $16 million (does not include the costs associated with fighting the structural fires caused by the Flat Top Complex).
- The Flat Top Complex burned forested and recently regenerated areas, destroyed power lines, and affected transportation and oil and gas operations.
- The insurance industry has estimated the insurable losses at over $700 million. That level of damage is unprecedented in recent Canadian wildfire history. There were also a significant number of people who did not have insurance coverage or were under-insured on property damaged or destroyed by the wildfire.

In addition to the direct losses resulting from the Flat Top Complex, there were significant impacts from the widespread wildfires across the province. Wildfires and the threat of wildfire can result in widespread shutdown of land-based industrial activity. The 2011 wildfires of Alberta caused major disruption of production of oil and gas as various pipelines and plants were shut down and camps were evacuated. Statistics Canada cited the wildfires in northern Alberta as a key contributor to the reduced petroleum production in the second quarter. During that period, gross domestic product declined and oil and gas extraction decreased by 3.6%.

Photo: SWF-065 on May 15 after burning into the Town of Slave Lake

# CONTEXT – PROVINCIAL, HISTORICAL, PROGRAM

## 2011 Fire Season

The history of wildfires across Alberta, including the threats of 2011, highlights the threat of wildfires to expanding development in the province. The number of wildfire starts across Alberta historically peaks in May (see Figure 8).

The 2011 fire season was preceded by a colder than normal winter with above average precipitation (60 to 80% above average). The snow in the Slave Lake area had completely melted by May 9. Between May 11 and May 14, 189 human-caused wildfires occurred across the province (see Figure 1), committing all available provincial resources. All available airtankers were engaged to support the 706 crewpersons and other seasonal staff in place to deal with wildfires as of May 15.

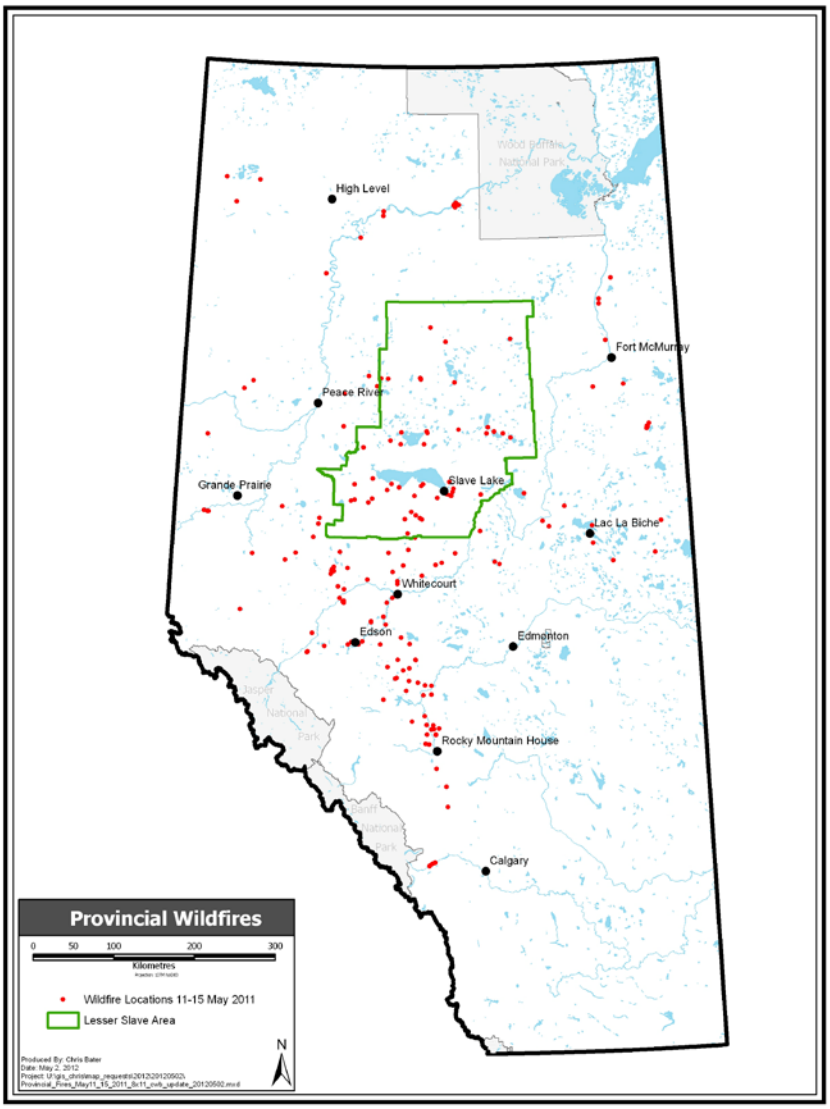



Figure 1 – Provincial Wildfires May 11 – 15, 2011

From May 11 to 15, 52 of the 189 wildfires in Alberta were in the Lesser Slave Area (see Figure 2). Several communities/locations (e.g., camps, worksites, parks, wildfire lookouts) were threatened throughout the province (see Table 1). During the extreme wind event and wildfire activity on May 14 and 15, 35 of the 52 wildfires in the Lesser Slave Area were contained.

| Areas | Number of Wildfires | Communities/ Locations Threatened |
|---|---|---|
| Southern Rockies (Calgary) | 5 | Morley Reserve |
| Foothills (Edson) | 25 | Lodgepole |
| Fort McMurray | 6 | Fort MacKay, Oilsands camps, Richardson Recreational Backcountry |
| Smoky (Grande Prairie) | 12 | N/A |
| Footner (High Level) | 14 | Fox Lake |
| Lac La Biche | 18 | Janvier, Chisholm, Long Island Lake |
| Peace (Peace River) | 7 | Cadotte Lake |
| Clearwater (Rocky Mountain House) | 22 | Crimson Lake Provincial Park |
| Lesser Slave (Slave Lake | 52 | Widewater, Canyon Creek, Poplar Estates, Town of Slave Lake, Faust, East Prairie/Enilda, Gift Lake, Wabasca, Red Earth, House Mountain area |
| Woodlands (Whitecourt) | 28 | Pass Creek, Carson Lake Provincial Park |
| **Total** | **189** | **Over 23 communities/locations threatened** |

**Table 1 – Number of wildfires by area and communities/locations threatened between May 11 and May 15**

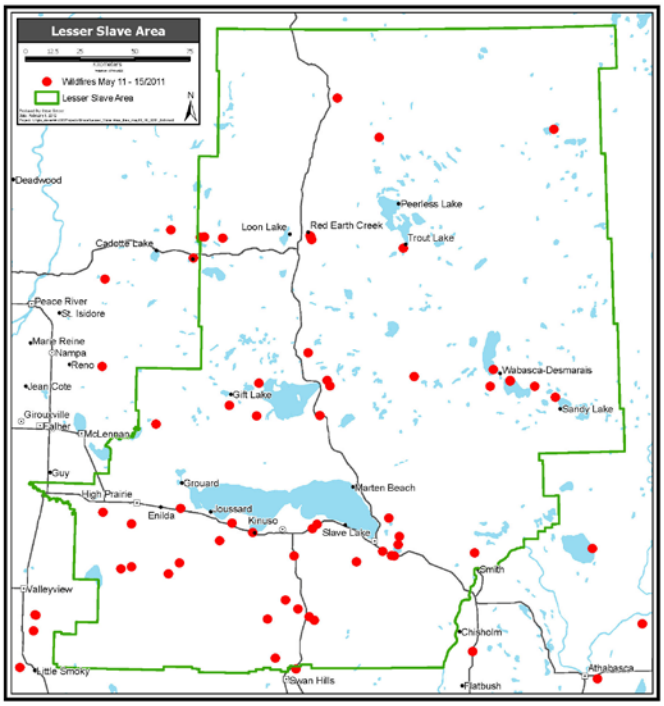



**Figure 2 – Wildfires in Lesser Slave Area May 11 – 15, 2011**

## Historical Perspective: Lesser Slave Area Wildfires

There have been a number of significant wildfires that have occurred in the Lesser Slave Area in the last forty-three years. The most serious of these were all driven by strong southeast winds and occurred in early spring. With the exception of the Chisholm wildfire in 2001, most of the damage was confined to forested areas, with minimal structural damage. Several of these wildfires burned towards the Town of Slave Lake, but were contained before reaching residential properties. Figure 3 shows five wildfires that burned in close proximity to communities in the Lesser Slave Area. The common factors with these wildfires are the general location relative to the Town of Slave Lake and the time of year.

In 1968, the Vega Wildfire burned over 133,550 hectares and ran 60 kilometres with unprecedented speed toward the Town of Slave Lake in one May afternoon and evening. The wildfire stopped just south of the town due to greatly diminished overnight winds and an influx of cool moist air the following day.

While the Mitsue Wildfire in May 1998 did not directly threaten the Town of Slave Lake, it did burn over 49,000 hectares south of Mitsue Lake. Wind pushed the wildfire away from town, and towards industrial facilities and personnel in the Mitsue Industrial Park.

The Chisholm Wildfire in 2001 burned over 116,000 hectares and came within 8 kilometres of the Town of Slave Lake. The wildfire did not reach the town due to changing weather conditions and fuels. The wildfire eventually burned into younger fuel types created by previous wildfires (Vega and Mitsue).

In May of 2008, a wildfire threatened the community of Wagner (just west of the Town of Slave Lake). The wildfire was contained before any homes were burned.

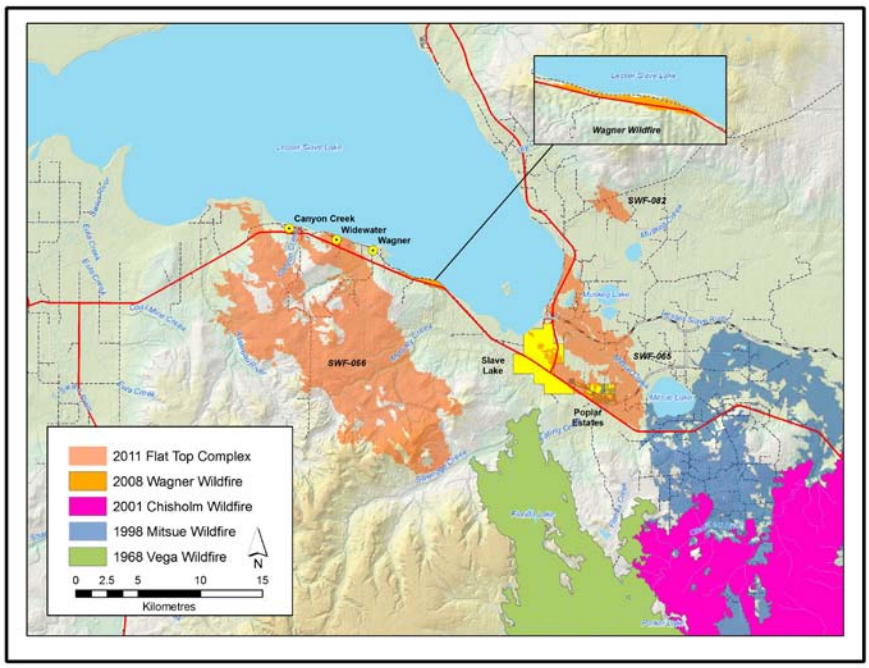



Figure 3 – Historical Wildfires in the Slave Lake Area

## Boreal Forest

The boreal forest is the dominant forest region in Canada, making up 35% of Canada's landmass and 77% of the country's forested land. It is also one of the world's largest ecosystems, comprising 10% of the world's forest cover. The boreal forest plays a vital role in sustaining ecological cycles, including wildlife diversity and carbon storage. It is an essential part of the environment, contributing to healthy air, water, and soil, and is also a vital economic resource. Within Alberta, the boreal forest constitutes 48% of the province's landmass and is predominantly coniferous.

Wildfire is a natural part of the life cycle of the boreal forest; many of the vegetation species, including trees, are well adapted to large, intense wildfires. These boreal wildfires typically burn as "crown fires", and are responsible for most of the area burned in the boreal forests of North America, Europe and Asia. Intense wildfires consume forest canopy and can spread from treetop to treetop, releasing huge quantities of sparks, smoke and other gases.

Before major wildfire suppression programs, boreal forests historically burned on an average cycle ranging from 50 to 200 years as a result of lightning and human-caused wildfires. Wildfire suppression has significantly reduced the area burned in Alberta's boreal forest. However, due to reduced wildfire activity, forests of Alberta are aging, which ultimately changes ecosystems and is beginning to increase the risk of large and potentially costly catastrophic wildfires.

Figure 4 illustrates the effect of wildfire suppression on age class distribution over time (based on the best interpretation of the historical forest inventory). There is an increased predominance of mature and overmature forests. This shift is a concern to wildfire managers, given the potential for increased wildfire behaviour.

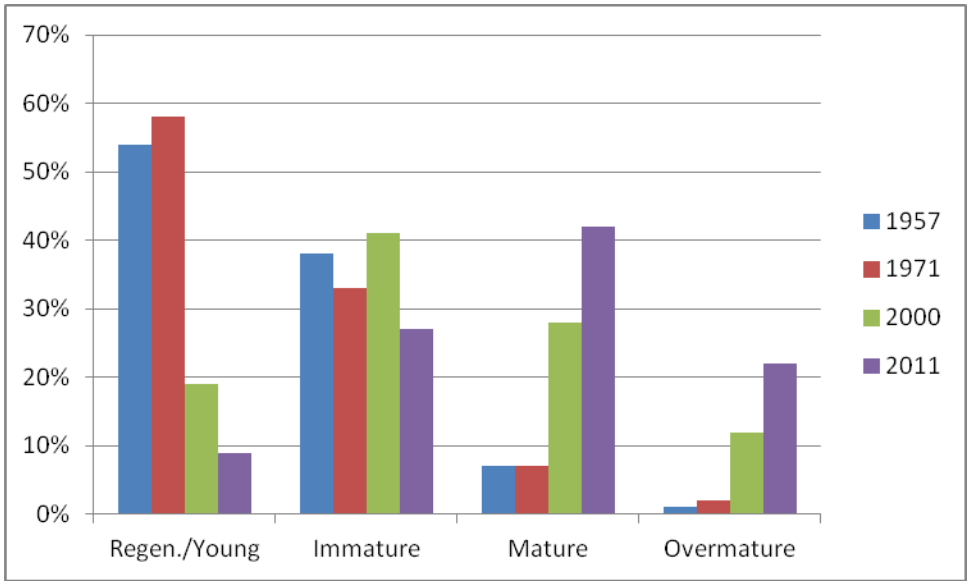



**Figure 4 – Comparison of Forest Inventory**

## Wildfires in North America

North Americans have experienced a number of catastrophic wildfire events during previous centuries, and recent trends indicate the potential for an increase in extreme events in spite of wildfire management efforts. In the United States, federal wildfire suppression expenditures are rising steadily, and have averaged $1.5 billion annually over the past decade, with an annual average burned area of 2.8 million hectares (approaching four million hectares in significant years) over the same period. A significant increase in larger and more severe wildfires has been observed in most jurisdictions in the world. Wildfire management agencies across North America are concerned about their ability to deal effectively with emerging and future wildfire management issues.

Wildfire management agencies in Canada have developed comprehensive wildfire management programs that attempt to balance the natural role of wildfire with the need to protect human life and property, along with recreational and commercial forest values. While these programs have demonstrated success, extreme wildfire danger conditions and multiple ignitions often combine to result in large wildfires. Under predicted climate change conditions, Canadian wildfire management agencies will likely be further challenged. Personnel, equipment, and aircraft will have to deal with wildfire activity and adverse impacts that are forecast to increase significantly.

Over the past two decades, nation-wide wildfire activity has averaged approximately 7,900 wildfires and 2.2 million hectares burned annually. Roughly 50% of the burned area occurs in regions of northern Canada where wildfires, in some jurisdictions, are allowed to burn naturally when not threatening communities or other values. Alberta has a full suppression policy under which the organization responds to all wildfires.

The insurable losses of the Flat Top Complex in May 2011 have exceeded all other previous Canadian wildfire events. This event likely foreshadows future wildfires that will threaten public health and safety, and the integrity of public, private, and industrial developments in wildfire prone environments.

## Wildland Urban Interface

The wildland urban interface describes an area where structures meet or are intermingled with the forest and vegetation. The potential for wildland urban interface wildfires is not new. Rapid population growth and urban expansion in close proximity to forest lands has been an emerging concern globally, and numerous instances of such wildfires demonstrate the potential for catastrophic losses. It is expected that the wildland urban interface will continue to increase in Alberta as industrial development, human populations, and residential areas expand in forested areas of the province. An expansion of the wildland urban interface will increase the risk of wildfires, which in turn will increase the risk of:

- Injuries and fatalities
- More communities being threatened and evacuated
- Reduced air quality and increased health effects from smoke
- Lost business and employment opportunities
- Reduced water quality and supply (including impacts to fish populations)

- Lost habitat required for species at risk (e.g., caribou, grizzly bears, limber/whitebark pine)
- Lost local wood supplies and recreational opportunities
- Increased wildfire suppression and community recovery costs
- Damage to property and infrastructure

The 2009 "Black Saturday" wildfires in Australia claimed 173 lives, injured 5,000, destroyed 2,029 homes, and burned 450,000 hectares. By mid-May of 2011, the Texas Forest Service responded to 1,096 wildfire incidents involving more than 728,000 hectares. Property damage included the loss of nearly 600 structures. Throughout its history, Canada has also experienced devastating wildfires that impacted communities:

*1825 – Miramichi Wildfire (New Brunswick)*
- Over 1.6 million hectares burned
- Over 160 people died (some estimates as high as 500)
- 1/3 of homes in Fredericton destroyed; nearly completely destroyed neighbouring towns

*1870 – Saguenay Wildfire, Lac St-Jean (Quebec)*
- Over 400,000 hectares burned
- Nearly 1/3 of people in Saguenay area lost their belongings; many people were injured and 7 died
- Nearly every building destroyed

*1908 – Fernie Wildfire (British Columbia)*
- Over 25,900 hectares burned
- Thousands of people left homeless; as many as 22 people died
- Nearly the entire city destroyed

*1911 – Cochrane Wildfire (Ontario)*
- Over 200,000 hectares burned
- 73 people estimated to have died
- Cochrane, Porquis, Goldlands, South Porcupine and parts of Timmins mostly destroyed

*1916 – Matheson Wildfire (Ontario)*
- Over 200,000 hectares burned
- 223 people estimated to have died
- Purquis Junction, Iroquois Falls, Kelso, Nushka, Matheson and Ramore were largely, or completely, destroyed

*1922– Halleybury Wildfire (Ontario)*
- 168,000 hectares burned
- 43 people died
- 90% of Halleybury was destroyed; all of North Colbalt, Charlton, Thornlow and Heaslip was destroyed

*1994 – Garnet Wildfire, Penticton (British Columbia)*

- Over 5,500 hectares burned
- Over 3,500 people evacuated
- 18 homes and structures destroyed

*1998 – Salmon Arm Wildfire (British Columbia)*

- Over 6,000 hectares burned
- Approximately 7,000 people evacuated
- 40 buildings destroyed

*2003 – Firestorm, Okanagan Mountain Wildfire (British Columbia)*

- Over 25,000 hectares burned
- 33,050 people evacuated (4,050 people also evacuated for a second time)
- 238 homes destroyed

*2008 – Lake Echo/Porters Lake Wildfire, Halifax (Nova Scotia)*

- Over 2,500 hectares burned
- 30,000 people evacuated

## Alberta Communities Impacted by Wildfires

Wildfires are a natural part of the Alberta landscape. A landmark wildfire occurred in May, 1919 in Lac La Biche, when the entire community was destroyed and 14 people died. Since 1961, recorded wildfires have burned over 7.7 million hectares in Alberta's Forest Protection Area (the portion of the province designated under the Forest Protection Area Regulation). The majority of Sustainable Resource Development's wildfire management activities occur within the Forest Protection Area (see Figure 5).

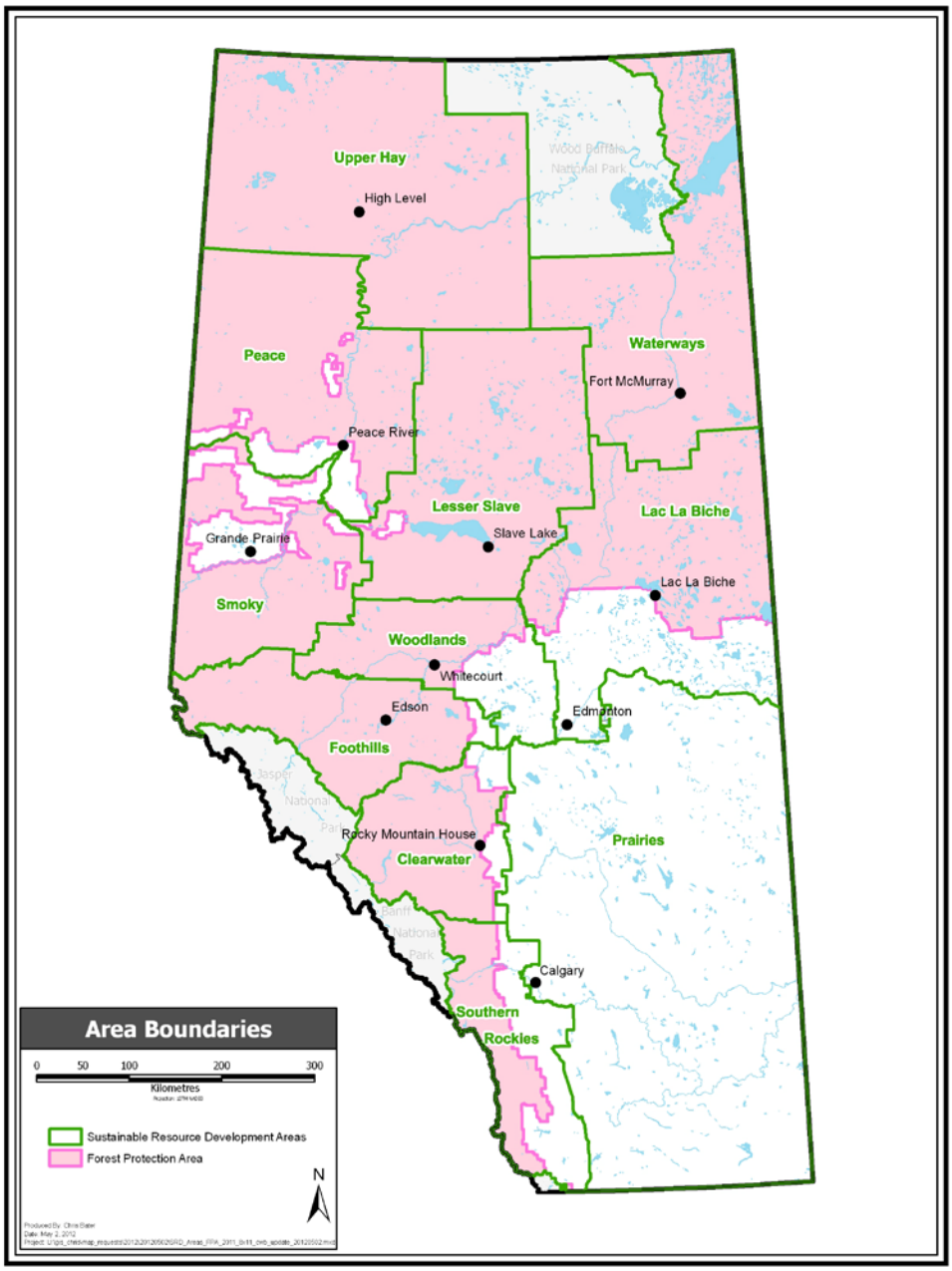



Figure 5 – Alberta's Forest Protection Area

The history of wildfires across Alberta, including those in 2011, highlights the threat of wildfires to expanding development in the province (Figure 6).

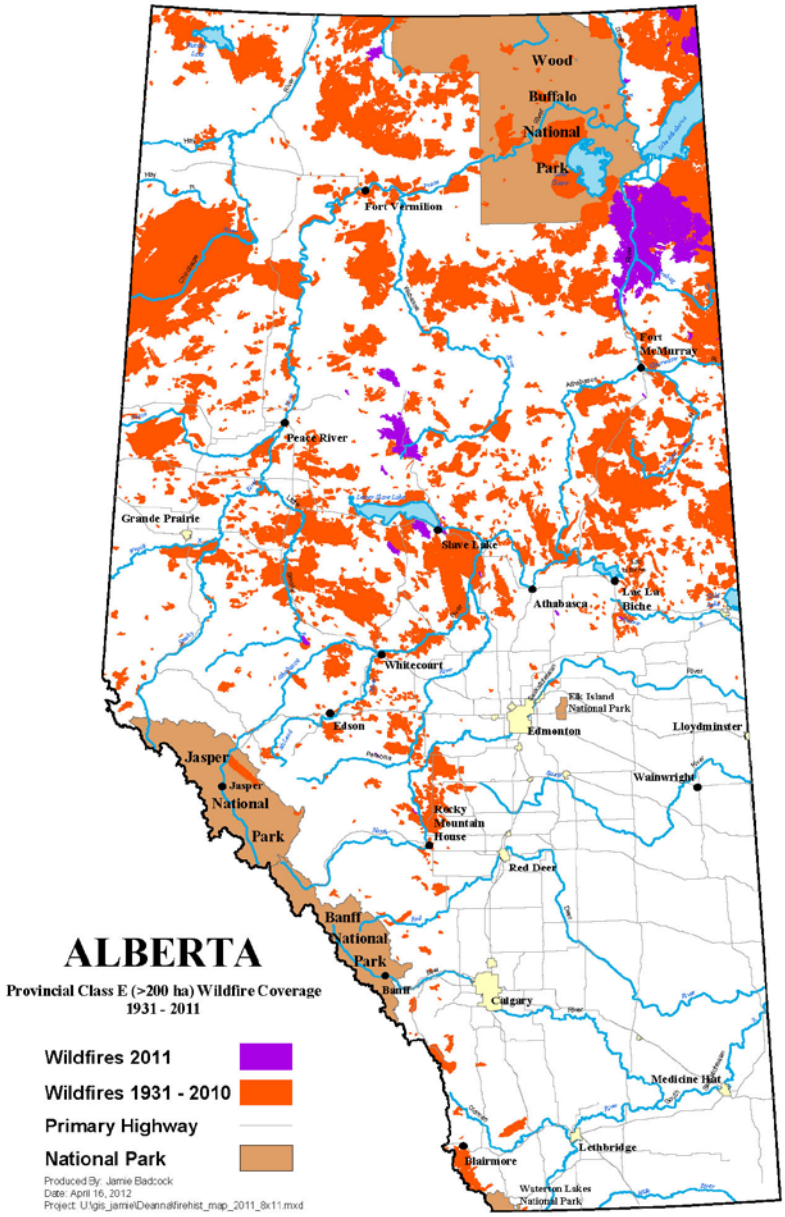



Figure 6 – Alberta's Wildfire History since 1931

The following provides a summary of six wildfires in Alberta that had significant impacts:

*1919 – Lac La Biche Wildfire*

- Well over 2 million hectares burned in Alberta and Saskatchewan
- 14 people died
- All but 3 buildings destroyed in Lac La Biche

*1950 – Chinchaga Wildfire*

- Approximately 1.4 million hectares burned in Alberta and British Columbia
- First known documented case in Alberta of using a backfire to protect a community (Keg River)
- Resulted in major change in wildfire management policy in Alberta (transition to full suppression in the northern part of the province)

*1998 – Virginia Hills Wildfire*

- Approximately 170,000 hectares burned
- Approximately 2,000 people evacuated in Swan Hills (some evacuated twice)

*2001 – Chisholm Wildfire*

- Approximately 116,000 hectares burned
- 10 homes, a trapper cabin, and 48 outbuildings destroyed

*2003 – Lost Creek Wildfire*

- Approximately 19,000 hectares burned
- Approximately 2,000 people evacuated
- 3 outbuildings destroyed

## Previous Alberta Wildfire Reviews

Following significant wildfire events in Alberta in 1998 and 2001, Sustainable Resource Development initiated the following comprehensive reviews of its wildfire management program:

- The 1998 Alberta Fire Review was conducted by KPMG, who provided 56 recommendations that covered a broad spectrum of activities.
- A review of the 2001 Chisholm wildfire was also completed by external experts. The Chisholm Fire Review Committee submitted five recommendations to the Minister of Sustainable Resource Development.

One of the five recommendations of the Chisholm Fire Review was for Sustainable Resource Development to place a high priority on implementing the outstanding recommendations of the KPMG report.

Since the Committee was mandated to conduct an assessment of Sustainable Resource Development's response to the Chisholm Fire Review Committee Final Report dated October 2001, they assessed the department's response to all recommendations of the 1998 and 2001 reviews (see Appendix C for a complete list of the respective recommendations from these reviews).

### 1998 ALBERTA FIRE REVIEW (KPMG)

The Committee concluded that:

- 42 of the KPMG recommendations have been completed.
- 12 recommendations are ongoing commitments that must continue to be monitored and updated (4 relate to human resource matters, such as capacity, standards, training, succession planning, and staff mentoring,; 8 are specific to matters such as research and development, improvement of outreach programs for Aboriginal people, providing high levels of wildfire management services, and developing more robust systems for landscape and fuel management issues). All of these items constitute the core business of Sustainable Resource Development, are incorporated into the department's strategic planning, and are therefore, subject to continuous review and improvement.
- 2 were considered incomplete, as there have been departmental reorganizations that rendered the recommendation moot, or there have been changes or limitations in the external environment.

The Committee is satisfied that Sustainable Resource Development has made every reasonable effort to fully address the recommendations of the 1998 Alberta Fire Review (KPMG), and believes that specific report should no longer be used as a benchmarking tool for performance. In addition, the world that the department operates in has changed considerably in the thirteen years since the 1998 Alberta Fire Review (KPMG), and new priorities and issues have developed.

### CHISHOLM FIRE REVIEW

The Chisholm Fire Review recommendations focused on communication, command and resource coordination, roles and responsibilities for community protection, and strategies to reduce the occurrence or impact of large wildfires. The Committee concluded that Sustainable Resource Development has made substantial progress on elements of these critically important issues. The Committee's comments related to the Chisholm Fire Review recommendations are embedded within the findings for the Flat Top Complex. The recommendations reflect today's reality, and consider the wildfire management context that has changed since the KPMG and Chisholm recommendations were made. The Committee suggests that its recommendations supersede those from the Chisholm Fire Review.

## Mandate and Legislation

Sustainable Resource Development engages in wildfire management (prevention, detection and suppression) primarily within the Forest Protection Area. The department also provides wildfire management support to municipalities outside the Forest Protection Area. The Forest Protection Area includes approximately 60% (39 million hectares) of the province's landbase. Alberta's legislated fire season runs from April 1 to October 31, but can be extended (earlier or later) if conditions warrant.

Wildfire management policy, procedures and programs are developed by Sustainable Resource Development's Wildfire Management Branch in Edmonton and delivered by Area offices. The department's strategic approach to wildfire preparedness is a 'high state' of readiness – which means being prepared to respond promptly to wildfires and the threat of wildfires in order to minimize losses. This strategy was reviewed by external experts in 2003, who concluded the approach provides the

best possible protection from wildfires in terms of effectiveness and efficiency. The Committee also supports this approach.

The department allocates firefighting resources based on the risk of wildfire to human life, communities, watersheds and sensitive soils, natural resources and infrastructure (listed in order of descending priority). Some of the key functions, components and targets forming a part of Sustainable Resource Development's wildfire prevention, detection and operations strategy include:

*Wildfire prevention*

- Working with industry, communities and municipalities to reduce the risk and severity of wildfires, and to enhance forest health
- Educating stakeholders
- Establishing fire control plans and cooperative wildfire agreements
- Developing and distributing information

*Wildfire detection*

- Detecting wildfires early and rapidly through a network of 128 lookouts, and aerial and ground patrols
- Detecting all wildfires at 0.1 hectares or less in size
- Reporting wildfires to the local Sustainable Resource Development fire centre within 5 minutes or less of detection
- Public reporting of wildfires through the department's 310-FIRE telephone line

*Wildfire operations*

- Maintaining a wildfire presuppression system
- Procuring qualified manpower, equipment, aircraft and support
- Coordinating and positioning wildfire suppression resources
- Conducting aggressive initial attack and sustained action of wildfires
- Providing for early containment of wildfires
- Maintaining and upgrading facilities for wildfire management (camps, airtanker bases, lookouts)
- Developing and maintaining standard operating procedures
- Completing internal/external reviews of wildfire management programs
- Containing wildfires within the first burning period (by 10:00 a.m. the day following assessment)
- Actioning wildfires at 2.0 hectares or less, and containing wildfires at 4.0 hectares or less

## FOREST AND PRAIRIE PROTECTION ACT

The main legislation respecting wildfire management activities in Alberta is the *Forest and Prairie Protection Act*, which came into force in 1971. There have been various amendments over the intervening period to adapt to emerging challenges.

The *Forest and Prairie Protection Act* provides for the prevention and suppression of wildland fires within the Province of Alberta, except on land within the boundaries of an urban municipality (where there is no specific provision in this Act to the contrary) and on land owned by the Government of Canada (if a fire control agreement with the Minister is not in place).

Under the Act, the Forest Protection Area Regulation designates significant portions of the forested area of the province as the Forest Protection Area. Sustainable Resource Development's activities respecting the prevention, detection, and suppression of wildfire occur primarily in the Forest Protection Area. The prevention, detection, and suppression of wildfires outside the Forest Protection Area are the responsibility of the local municipality. The Act authorizes the Minister to fight a fire within a municipal district or an urban municipality where it appears to the Minister that satisfactory action to control and extinguish the fire is not being taken by that municipality and that the fire might damage public land.

### SAFETY

The protection of persons and property is one of the Alberta government's core businesses. Sustainable Resource Development policy states, "Firefighter and public safety is the first priority in wildfire management. All wildfire operations and activities must reflect this commitment." (See Appendix F for additional information on Sustainable Resource Development's policies and procedures).

Responder safety becomes more challenging during wind events. The conditions related to the Flat Top Complex presented significant safety challenges for positioning firefighters and heavy equipment appropriately. Flying embers, debris, heavy smoke, and the potential for trees falling due to the extreme wind combined to create an extremely dangerous situation.

## Preventing Wildfires

### HUMAN-CAUSED WILDFIRES

Wildfires that are classified as "human-caused" are caused by a wide range of human activities. With rapidly increasing use of Alberta's wildlands, the risk of people and equipment starting wildfires is also increasing. This is reflected by the significant increase in human-caused wildfires as shown in Figure 7.

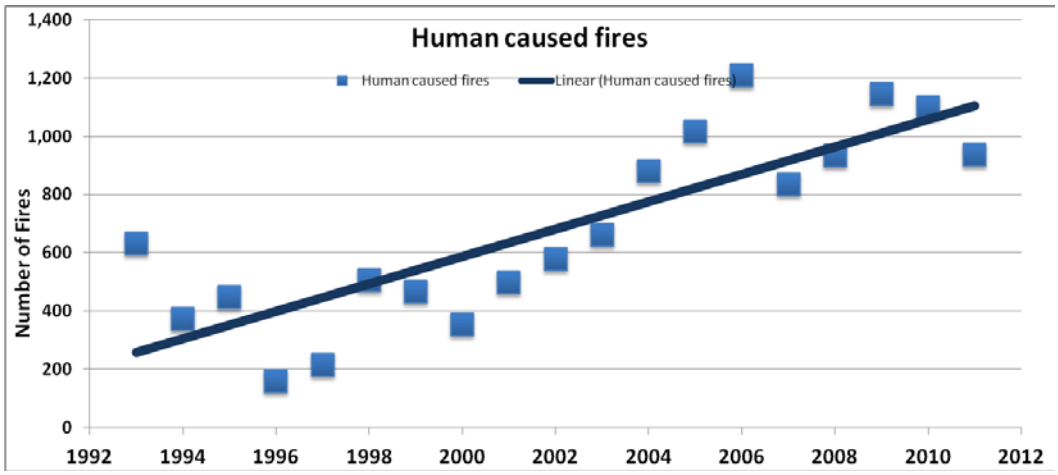



Figure 7 – Human-caused Wildfires from 1992 to 2011

The key causes of wildfires in Alberta from 2002 to 2011 inclusive (April 1 to March 31) are as follows:

| Wildfire Cause | Frequency of Occurrence |
|---|---|
| Lightning | 39.7% |
| Resident | 22.6% |
| Recreation | 20.5% |
| Incendiary | 4.7% |
| Power line Industry | 3.2% |
| Oil & Gas Industry | 2.0% |
| Forest Industry | 1.6% |
| Other Industry | 2.5% |
| Railroad | 0.1% |
| Undetermined/Miscellaneous | 3.1% |

Table 2 – Wildfire Causes (2002-2011)

The key causes of wildfires in Alberta in 2011/12 (April 1 to March 31) are provided in Table 3. It should be noted that, in 2011, power lines caused 11.5% of all wildfires, which was a significant increase from the 10-year average frequency of occurrence (see Table 2). It was explained to the Committee that the majority of power line caused wildfires were due to extreme winds, which caused trees to contact power lines.

| Wildfire Cause | Frequency of Occurrence |
|---|---|
| Lightning | 18.0% |
| Resident | 23.6% |
| Recreation | 28.7% |
| Incendiary | 8.5% |
| Power line Industry | 11.5% |
| Oil & Gas Industry | 2.5% |
| Forest Industry | 2.5% |
| Other Industry | 1.2% |
| Railroad | 0.1% |
| Undetermined/Miscellaneous | 3.4% |

Table 3 – Wildfire Causes (2011/12)

## Preparing for and Responding to Wildfires

Sustainable Resource Development wildfire management activities occur primarily within the Forest Protection Area, outside the boundaries of urban municipalities. The urban municipality (city, town, village, summer village) has the primary responsibility to prevent and control fires within its boundaries. In the case of wildland urban interface wildfires, there is significant cooperation between Sustainable Resource Development and local fire departments. In many cases, a fire control agreement is created to facilitate the roles and responsibilities of the respective organizations. To further clarify and detail roles and responsibilities during an emergency, the province adopted the Incident Command System. This system was developed in the United States and is the emerging standard for Canadian agencies dealing with wildfire command and control.

## FIRE SEASON

Under the *Forest and Prairie Protection Act*, the fire season starts April 1 and ends October 31, but it can be modified by Ministerial Order. Figure 8 shows the number of wildfires by 5-day period (1961 to 2011, averaged by 5-day period) with differentiation for human- and lightning-caused wildfires. It is clear the wildfire workload starts in early to mid- April, with a very high peak of human-caused wildfires late April to mid-May. The number of human-caused wildfires diminishes very quickly before the lightning season picks up, and resumes late September and October.

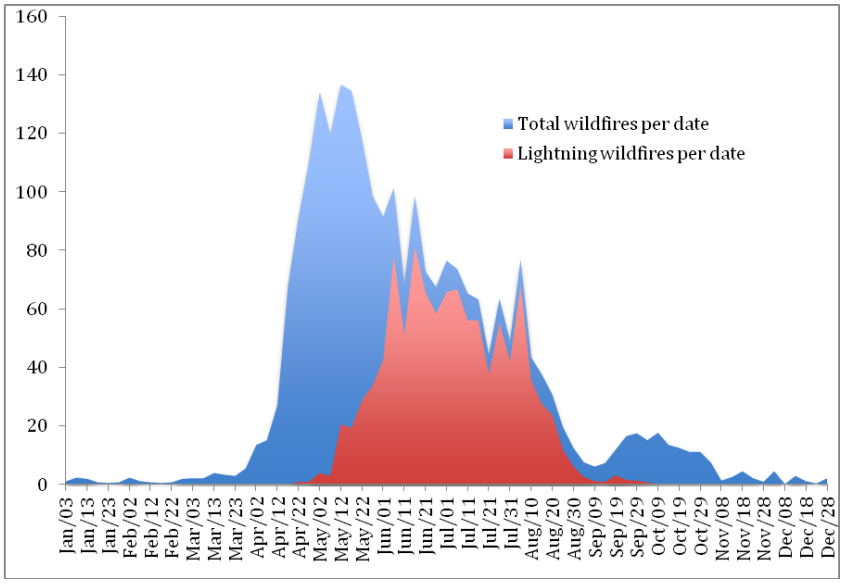



**Figure 8 – Wildfire Starts by Date in Alberta (1961 to 2011, Averaged by 5-day Periods)**

## PRESUPPRESSION PREPAREDNESS SYSTEM

In an effort to evaluate options for informed decisions, as well as achieve management objectives and measure performance regarding wildfire, Alberta has developed a Presuppression Preparedness System. It is used to guide Duty Officers in each of the Areas in assessing the wildfire danger and risk, so that appropriate wildfire suppression resources are committed and strategically located to reduce response times for initial attack. The main objective of the Presuppression Preparedness System is to minimize the potential for large wildfire losses through a cost effective initial attack strategy. The system relates fuels on the landscape with actual or forecasted weather to predict the mean "head fire intensity", or HFI (the predicted intensity, or energy output, at the front or head of the wildfire) for each Area. Aircraft and ground resources are located throughout each Area based on predicted hazard and risk, with the objective of initial attack resources arriving at the new wildfire start before it reaches 2 hectares in size.

Photo: Sustainable Resource Development firefighters putting out spot fires on SWF-065 - May 16

Photo: Bulldozers used on the Flat Top Complex to build fireguards (barrier constructed to stop or retard the wildfire's rate of spread)

## PROGRAM BUDGET

Sustainable Resource Development's wildfire management program is funded via a base budget allocation for readiness, which includes staff salaries, vehicles, training, and airtankers. The readiness funding also includes an allocation for FireSmart, including community and landscape level funding. There is also an allocation for day-to-day firefighting, which starts at $12 million annually. Treasury Board may approve additional funding if an Order in Council declaring an emergency is approved, pursuant to the *Fiscal Responsibility Act*.

Sustainable Resource Development has maintained the wildfire management program by responding to budget pressures through adjustments in staffing, including a reduction in the core period for firefighting crews and other seasonal resources. A key pressure on the ability of Sustainable Resource Development to prepare for wildfires is the increasing costs of firefighting resources, including staff (management and crews), contracts (aircraft, crews, and equipment), facility maintenance/upgrades, and supplies (e.g., fuel, retardant).

An important reference on level of readiness is the number of personnel available to fight wildfires. Across Canada, the average staffing of major wildfire management agencies (not including Alberta) is 0.54 FTE (full-time equivalent) per wildfire (average), whereas Alberta has 0.37 FTE per wildfire when fully staffed (based on data supplied by the Canadian Interagency Forest Fire Centre). Staffing in Alberta's 2011 wildfire management program was approximately

0.34 FTE per wildfire due to vacancies. Alberta supplements their staff resources with contract crews. In 2011, Alberta had 32 eight-person contract crews.

During normal seasons, large agencies such as Alberta's wildfire management organization, benefit from economies of scale and can meet demands through movement of resources. The continuing pressure on staffing in the face of increasing workload presents significant challenges for staff and firefighters, during average to extreme conditions. Under above normal wildfire conditions, there is an increasing reliance on contractors and mutual aid resources from other provinces/territories and international sources.

## PROGRAM ORGANIZATIONAL MODEL

The Department of Sustainable Resource Development is composed of four divisions led by Assistant Deputy Ministers. These divisions include Forestry, Lands, Fish and Wildlife/Area Operations and Corporate Services. The Assistant Deputy Minister for the Forestry Division is responsible for Wildfire Management, Forest Management, and Forest Industry Development. The Executive Director for the Wildfire Management Branch within the Forestry Division is responsible for the policy and regulatory framework and program development for wildfire management. The people and assets used to manage wildfires are embedded within Area Operations under the supervision of Area Managers. Area Managers are accountable to the Assistant Deputy Minister responsible for the Fish and Wildlife/Area Operations Division.

Wildfire operations are monitored provincially through the Provincial Forest Fire Centre in Edmonton. The Centre is a part of the Wildfire Management Branch, and fulfills a number of critical tasks that include, but are not limited to the following:

- Monitoring all wildfire fighting operations in the Forest Protection Area (the Duty Officer within the Provincial Forest Fire Centre receives, reviews and signs off on all daily Presuppression Preparedness Plans that are submitted by Area Duty Officers).
- Establishing provincial wildfire fighting priorities based on provincial policy and the potential for the greatest effect on values at risk.
- Receiving resource requests (ground and air assets) and actioning those requests in accordance with provincial priorities. Resource requests can be met by redeployments from one Area of the province to another or by requesting additional assistance through various resource sharing agreements (e.g., Canadian Interagency Forest Fire Centre, Northwest Compact).

Area Duty Officers are part of the Area Manager's organization. They report to the Area Forestry Program Manager who, in turn, reports to the Area Manager. Area Duty Officers are responsible for wildfire operations at the field level within their designated Area. When Incident Commanders are deployed to assume operational responsibility for major wildfire events, they become a temporary addition to the Area Manager's resources. The current program organization model has dual accountability networks. People and assets in Area wildfire operations follow an accountability pathway through to the Fish and Wildlife/Area Operations Division. During the fire season, decisions with respect to wildfire operations flow from the Area, either through the Incident Commander or Area Duty Officer, direct to the Provincial Forest Fire Centre.

Accountability for the Provincial Forest Fire Centre resides within the Forestry Division. Shared accountabilities create complexities that can be problematic for organizations engaged in emergency operations.

## MUTUAL ASSISTANCE RESOURCE SHARING

In addition to the resources available directly within the organization, most wildfire management agencies realize there is a need to share resources with other agencies. This approach has been escalating within the wildfire community, starting in 1982 with the signing of the Canadian Mutual Aid Resource Sharing (MARS) agreement and the creation of the Canadian Interagency Forest Fire Centre (CIFFC). Through the MARS agreement and coordination through CIFFC, resources can be requested by any Canadian wildfire agency and by agencies outside of Canada. External resources from the United States are available through the Canada/United States Reciprocal Forest Fire Fighting Arrangement, which is administered through the United States National Interagency Fire Centre, and in the case of Canadian requests, routed through CIFFC. This provides access to firefighting resources of the federal United States agencies and some state agencies. Orders through CIFFC for personnel resources (crews and specialists) that are readily available can be filled on average in about three days, whereas aircraft resources can be moved more quickly.

In order to increase access to state level resources and potentially facilitate access to regional, provincial and territorial personnel, the Northwest Compact emerged in 1998 and now involves Alberta, British Columbia, Saskatchewan, Yukon, Northwest Territories, Alaska, Washington, Montana, Idaho, and Oregon. Manpower requests are generally filled in two to three days. The Northwest Compact agreement provides for direct discussions with provinces, territories, and states. In addition, border zone agreements are in place with most agencies, which allow for immediate action on wildfires located near jurisdictional borders.

## WILDFIRE DETECTION AND RESPONSE

Wildfires are detected by the network of wildfire lookouts across Alberta, by aircraft flying in the area, by people travelling throughout the province, or by other means. Individuals who spot a wildfire or smoke can report it to Sustainable Resource Development by phone or by the radio network. It was clear that the wildfires of the Flat Top Complex were promptly detected and reported.

Once the appropriate wildfire location is known, the Sustainable Resource Development Area can direct crews, aircraft and equipment to begin action on the wildfire under the supervision of an Incident Commander. The performance standard for “initial attack success” is to contain the wildfire (stop the wildfire from growing), by 10:00 am the day following Sustainable Resource Development’s assessment of the wildfire (first burning period). The performance target for 2011/12 was 97.7 per cent (the rolling average of the results of the past five years). In 2011/12, Sustainable Resource Development contained approximately 96.1 per cent of Alberta’s wildfires within the first burning period.

Wildfire conditions, level of wildfire activity, and resource availability affect Sustainable Resource Development’s success at achieving the performance standard. If it becomes apparent that

Sustainable Resource Development will not meet the standard, the attack is expanded to what is called "sustained action". Sustained action generally involves activation of contract crews, along with expanded command roles, including deployment of an Incident Management Team if the complexity of the event requires more than one person to manage it. It is common for the final expansion with all positions to be completed within 24 to 48 hours.

## FIRESMART

In Canada, FireSmart outlines the principles and guidelines for proactive wildfire management. FireSmart is aimed at reducing the risk of structure ignitions from wildfire, decreasing the severity of wildfire behaviour potential, and enhancing the effectiveness of wildfire suppression resources in containing wildfires in the wildland urban interface. It includes a suite of actions that governments, industry and private property owners (including homeowners) can take to reduce the risk of wildfire, such as the removal or conversion of forest fuels; the use of fire resistant building materials; developing bylaws and building codes; and increasing public awareness and education.

Sustainable Resource Development initiated a FireSmart program in 1997. Since then, the program has included fuel treatments on provincial Crown lands near communities, and the provision of technical and financial assistance to communities in the Forest Protection Area (through the FireSmart Community Grant Program). FireSmart also includes outreach initiatives such as the FireSmart Community Series and the publication of several documents including the FireSmart Guidebook for Community Protection and the FireSmart Guidebook for the oil and gas industry. The total annual budget allocation for Sustainable Resource Development's FireSmart Program is $2 million (for FireSmart projects led by Sustainable Resource Development, and the FireSmart Community Grant Program). Within that budget allocation, there have been no increases since 2005.

The FireSmart Community Grant Program began in 2005 and is aimed at assisting wildland urban interface communities in developing and implementing a FireSmart Community Wildfire Protection Plan. As of 2010/11, 82 communities in Alberta had wildfire mitigation strategies, and 154 had wildfire prevention guides. Many communities in the Forest Protection Area continue to be at risk from wildfire. Of particular concern are interface areas with adjacent black spruce stands. In addition, there are many interface communities that are at risk of wildfire, but that are not eligible to receive funding under the current grant program because they are outside of the Forest Protection Area.

It has been projected that the planning and treatments necessary to fully implement FireSmart in Alberta will require a substantial investment. In order to facilitate effective and efficient investments, proper assessments must be completed and treatments refined as more is learned and innovative approaches developed. In that regard, the Committee believes that further research and monitoring of treatment effectiveness, along with development of appropriate decision support tools, will support FireSmart investments.


Photo: FireSmart community initiative in the Town of Slave Lake, 2012

In terms of funding available for communities, Sustainable Resource Development has provided funding to the FireSmart Community Grant Program from its $2 million budget allocation for FireSmart. The amount of funding has varied from year to year, and has not met the annual demand from communities. For example, in 2007, only six of the 15 communities that applied for assistance received funding. In 2010, Sustainable Resource Development did not allocate any funds to this program due to fiscal constraints. At times, additional funds have been provided to communities by Alberta Municipal Affairs and federal funding (matched with provincial funds and delivered through the Forest Resource Improvement Association of Alberta (FRIAA)). In 2011, there was a separate allocation of funds to the Slave Lake area under the Lesser Slave Lake Regional Wildfire Recovery Plan. Figure 9 shows the approximate distribution of FireSmart funding made available from various sources. At the time of this report, funding from the Slave Lake FireSmart Fund was confirmed for 2012 and 2013. Confirmation of funding from other sources for those two years was pending.

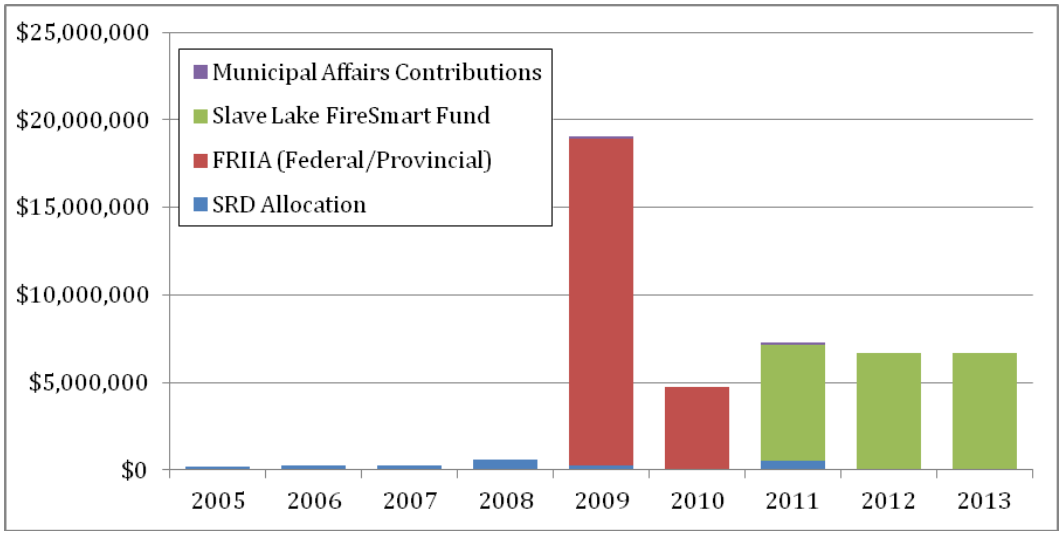



**Figure 9 – Community FireSmart Funding Sources**

# KEY FINDINGS AND RECOMMENDATIONS (BY THEME)

## Overall Findings

At its simplest, the Flat Top Complex wildfire activity that destroyed homes and property on May 14 and 15 in the Town of Slave Lake and Municipal District of Lesser Slave River resulted from two wildfires and an extreme wind event. Viewed more comprehensively, this complex wildfire event brought together a challenging combination of historical, operational and environmental conditions that put human lives and communities at risk, stretched resources and placed exceptional demands on all involved.

Documentation shows that wildfires with explosive growth have occurred across the Alberta landscape since recorded history, and some experts have indicated that the potential for wildfires of significant impact is going to increase. Most of the extensive wind-driven wildfires in Alberta have occurred in the spring, including some in the vicinity of Slave Lake; for example, the Vega wildfire (May 23, 1968), Mitsue wildfire (May 2, 1998), Chisholm wildfire (May 23, 2001) and Wagner wildfire (May 5, 2008). These previous extreme wildfire events in the Slave Lake area had less impact on communities than the Flat Top Complex, generally as a result of changes in weather conditions and fuel types before they reached urbanized areas.

The Committee considers the Flat Top Complex as the strongest warning to date that expanded residential and industrial development in Alberta's wildlands, in combination with increasingly severe wildfire conditions, requires increased focus by fire control organizations (structural and wildfire) as well as stakeholders, communities, and the public. All parties need to make adjustments to recognize, prepare for, mitigate and respond to wildfires in order to minimize risk to health and safety, and reduce damages. The risk cannot be completely eliminated, but significant efforts to reduce the risk would be prudent, as the threat accelerates.

The Committee has made recommendations they feel will have the best possible impact on wildfire management in Alberta. The Committee expects these recommendations could be implemented over a reasonable timeframe. Some of these improvements will require focus both from a budgetary and priority perspective. The Committee notes that typically following extreme wildfire events in jurisdictions across Canada and other parts of the world, motivation to deal with prevention of disasters is quickly lost among other priorities. Consequently, similar issues arise and have to be dealt with again. The Committee feels strongly that priority should be placed on addressing the recommended improvements in this report on a sustained basis.

### WILDFIRE PREVENTION

There are two key areas of wildfire prevention that were the subject of discussions with experts, staff and stakeholders:

- The wildfires leading up to and including the wildfires involved in this event were human-caused and therefore preventable.

- The FireSmart program, which was developed to reduce the negative impact of wildfires on human health and safety, communities, homes, industries and landscapes.

### *Prevention of Human-caused Wildfires*

There are a wide range of sources for human-caused fires. The Committee found that a large number of human-caused wildfires occurred over a short time frame leading up to May 15. From May 11 to May 15, Sustainable Resource Development fought 189 human-caused wildfires provincially, of which 52 were in the Lesser Slave Area. In 2011, approximately 80% of the wildfires were human-caused, whereas the five-year average is about 60%. 2011 emphasized the potential costs and impacts that human-caused wildfires can have directly and indirectly. Sustainable Resource Development's stakeholders and the public need to more fully understand the importance of specific prevention initiatives.

During some of the focus group sessions with the Committee, concerns were raised regarding the number of power line wildfires that occur during extreme wind conditions. One hundred and thirty-eight power line wildfires started in Alberta in 2011. Power line wildfires were also recognized in the 1998 Alberta Fire Review (KPMG), which recommended variable widths for power line rights-of-way and hazard reduction. Sustainable Resource Development implemented "limited liability" in fire control agreements with power line companies, as a means of providing incentive for industry wildfire prevention actions. Given the number of wildfires attributed to industry causes, the Committee believes that limited liability has not had the effect that was originally anticipated.

*What it Means:*

The number of human-caused wildfires leading up to May 14 and 15 stretched provincial resources. Sustainable Resource Development needs to enhance its communications to stakeholders and the public regarding the reasons for implementing specific prevention actions. This will help the department gain support and acceptance for these initiatives.

**Recommendations:**

1. Implement significant enhancements to wildfire prevention measures, including widespread fire bans, forest area closures, fire permit management, and elevated fines during extreme weather and/or wildfire behaviour conditions. Special consideration should be given to prevention activities early in the fire season. In addition, Sustainable Resource Development should enhance communications of these initiatives to stakeholders and the public to gain their support and acceptance.
2. Enhance wildfire prevention measures to aggressively address the increase in human-caused wildfires. Evaluate the effectiveness and future use of limited liability (as currently expressed in industry fire control agreements) to facilitate effective wildfire prevention by industries operating within the Forest Protection Area.

## *FireSmart*

Prior to the Flat Top Complex, some FireSmart activities were initiated in the Slave Lake area. Funding from the FireSmart Community Grant Program was provided to conduct thinning of fuels in the south shore area. Funding was also provided through the Forest Resource Improvement Association of Alberta's Fire Hazard Reduction and Forest Health Program for projects in the Mitsue Industrial Park area and the Sawridge First Nation. Thinning and pruning to reduce black spruce fuels adjacent to the tourism centre was completed by the Municipal District of Lesser Slave River and a mitigation plan was completed for the south shore Turner Subdivision. In addition, Sustainable Resource Development and Municipal District staff conducted annual spring and fall hazard reduction burning programs adjacent to the Slave Lake area communities. Although several fuel reduction initiatives were underway, the Slave Lake communities had not completed a FireSmart Community Wildfire Protection Plan. It became apparent to the Committee during the focus group sessions that the public, and many of the stakeholders, were not aware of the potential wildfire risk to their community, nor were many aware of the proactive measures they could take to reduce the risk of wildfire impacting their health and safety, community and homes.

Since FireSmart was initiated as a program in Sustainable Resource Development in 1997, the framework to engage communities has been evolving. FireSmart activity has been inconsistent, relying on sporadic and limited provincial and federal funding allocations. Although the demand has increased, there has not been a corresponding increase in FireSmart expenditures at all levels (homeowner, community and landscape). In discussions with stakeholders, it was apparent to the Committee that FireSmart was not a consistent consideration in local government priorities. The main responsibility for FireSmart within the Government of Alberta has rested with Sustainable Resource Development, with some support from Municipal Affairs. The Committee believes the wildland urban interface encompasses several jurisdictions. Consequently, a number of other provincial government departments, local and federal governments, and organizations should have a more prominent role in ensuring communities, industry, and homeowners reduce the potential impacts from wildfire.

*What it Means:*

Although there were actions taken to reduce fuel loading in the Slave Lake area prior to the Flat Top Complex, more could have been done. More detailed planning may have revealed the risks presented by surrounding coniferous fuels, resulting in a local and provincial priority to treat them. The province has an excellent framework for FireSmart but, without broader acceptance, greater partner participation, and accelerated implementation, many communities remain at risk for this type of event.

Local leaders and private landowners (including homeowners) in the wildland urban interface must recognize the risks that are present, and that they have a responsibility to lead initiatives and take preventative action to protect themselves and their communities, homes, and businesses from wildfire. This should be an important consideration for both new and existing developments.

**Recommendations:**

3. Establish a revised delivery model for a FireSmart program under one provincial framework, including a streamlined and enhanced funding model.

   Wildfire mitigation and preparedness should be a shared responsibility between federal, provincial and municipal governments, private landowners and industry. An external process, involving other partners such as the Alberta Association of Municipal Districts and Counties; Alberta Urban Municipalities Association; Alberta Municipal Affairs; Alberta Intergovernmental, International and Aboriginal Relations; Aboriginal Affairs and Northern Development Canada; should be established to identify and administer funding, including establishing priorities and funding projects. Principles for the process could be based on the Forest Resource Improvement Association of Alberta and Slave Lake FireSmart models. This revised delivery model should involve increased and sustained funding in an expanded FireSmart program. The expanded program should include assistance to at risk communities outside the Forest Protection Area, and should include homeowners, businesses and other private landowners. Sustainable Resource Development should maintain a significant role in promoting public awareness and providing expertise to advise the process and link to landscape level and industrial FireSmart initiatives.

4. Accelerate fuel management treatments near communities in forested areas that are at risk from wildfires. Priority should be given to thinning or conversion of coniferous stands, particularly black spruce, which threaten community developments (as identified through strategic analysis of wildfire threat potential).

## PREPAREDNESS AND CAPACITY

Alberta, like most jurisdictions, has been affected by the global economic climate, which has resulted in budget constraints that have impacted funding and resources available for services in the province. Although Alberta has provided reasonable funding for wildfire management resources, that budget is continuing to be eroded by increased operational costs and the expanding wildfire management workload of approximately 5+% per year. Sustainable Resource Development has adapted by contracting wildfire crews, shortening terms for in-house crews and periodically utilizing staff from other programs within the department (e.g., Forest Management, Fish and Wildlife, Lands). Specific areas in which capacity should be improved include developing in-house expanded attack crews, advancing the start dates for firefighting resources (manpower, equipment, and aircraft), and enhancing access to retired staff who have current expertise.

Given the overwinter conditions, most stakeholders felt Sustainable Resource Development's 2011 pre-season preparations were on schedule, with the exception of finalizing some crew contracts. Until just a few days before the Flat Top Complex, there was still snow on the ground in many areas. Spring wildfire hazard conditions, however, can quickly change from low to extreme. Statistically, May is the busiest month in terms of large wildfires; but, many of the resources do not arrive/are not available until May or later. In 2011, wildfire conditions leading up to May 14 and 15 stretched the department resources available at that time.

The Committee believes presuppression planning could have been more comprehensive. With the current organizational structure encompassing multiple Areas, various value judgments were made across the province regarding presuppression preparations. The Committee believes Area Forestry Program Managers should routinely make their decisions with the benefit of advice from fire behaviour specialists.

Area presuppression planning must take into account the potential need to redeploy Area assets to other priorities on short notice. Sustainable Resource Development made decisions regarding placing manpower on standby, mobilizing heavy equipment operators or seeking additional wildfire fighting crews from other jurisdictions proactively each day based on Alberta's Presuppression Preparedness System. The system has two distinct parts. The first part is a deployment procedure for allocation of the committed initial attack resources based on values at risk, priorities, local wildfire risk, fuel types and analysis of inter-Area coverage. The second part is a procedure to determine Area man-up levels and subsequent resource commitments based on wildfire danger. In general terms, the system works as follows: as the wildfire danger increases, additional suppression resources are committed and strategically placed to reduce travel time to a potential wildfire start.

There was concern at Sustainable Resource Development's Provincial Forest Fire Centre that the potential for a catastrophic event to occur somewhere in Alberta's Forest Protection Area on the weekend of May 14 - 15 was exceptionally high. The Fire Weather Advisory and wildfire conditions justified the proactive preparations that were taken by Sustainable Resource Development before the winds and wildfires occurred.

*What it Means:*

Budget pressures have caused an erosion of staff, crew and aircraft resources over time. Sustainable Resource Development has an annual turnover of seasonal firefighters (approximately 20%) and permanent staff (about 2%). For some firefighters, the Flat Top Complex was their first experience responding to wildfires. During the build up of wildfire activity leading to the event, initial attack crews became committed to dealing with large wildfires (including supporting structural firefighting and structural protection), as there were limited expanded attack resources available. The deployment of "structural protection systems" (sprinklers) used to protect homes and buildings was rapid. This approach has been developed with Sustainable Resource Development and its partner agencies across Canada. The challenge that arises during extreme and widespread wildfire events is the deployment of sprinklers becomes a drain on the resources needed to stop wildfires from spreading.

Generally, Sustainable Resource Development's legislated fire season starts on April 1 each year; however, most of the resources are not in place until later in the spring. This situation was also recognized in the 1998 Alberta Fire Review (KPMG) recommendations. Trends show that wildfires are starting earlier; therefore, preparation needs to begin earlier in the season (e.g., manpower, airtankers, and other resources).

Alternate crew systems should be considered to strengthen attack on highly threatening wildfires. United States wildfire agencies developed a crew concept in the 1940s called "Hot Shot" that is now their national standard. This standard was imported into British Columbia in the 1980s and called the "Unit Crew". These crews are highly trained, experienced and versatile, and can be involved in both initial attack and sustained action as needed. They are also a key resource in providing support to prescribed burning and FireSmart activities. In the United States and British Columbia, these crews are a critical component of "expanded attack". The term is used to define a situation in which it is clear that initial attack in its usual form may not succeed, and the risk of failure is a concern. Because these crews are much larger than initial attack crews, they are a mechanism to expand attack quickly on a wildfire. Sustainable Resource Development requested Unit Crews from British Columbia for the Flat Top Complex. These resources arrived on May 17.

An area of concern expressed to the Committee was the challenge of retaining wildfire personnel, especially at the seasonal crew level. Turnover rates are about 20% per year, which means a significant loss of training and knowledge. Training cannot prepare crew members for all conditions and especially extreme events, clearly a concern during the Flat Top Complex. Experience is critical. The following four factors may contribute to the significant loss of experience:

- The short season of employment (approximately 3 months) offered to crew members;
- The lack of opportunity for full year employment for those who may want to begin a career in wildfire management;
- Significant earnings and career potential in some industries in Alberta limit recruitment potential; and
- The fact that many seasonal staff only work fighting wildfires during the summers while they are in university, and move on to their chosen career path after graduation.

**Recommendations:**

5. Advance start times for resources, including crews, equipment and aircraft contracts, to be fully ready for potential early fire seasons. Ensure staff vacancies are filled as soon as possible. Expand work terms to year round for a portion of firefighting crews to support retention and provide capacity for FireSmart initiatives.

   Staff training and practice exercises should occur to prepare for an April 15 readiness date. Given the reliance on student crews and their late availability, a portion of crews should have extended early seasons or be made permanent. As well, Sustainable Resource Development should establish formalized access to retired staff, including a certification process to ensure upgraded skills.

6. Develop in-house expanded attack firefighting crews to provide sustained action capability and other wildfire management functions (modeled after the United States Hot Shot crews and/or British Columbia Unit Crews). These crews will enhance response capability on complicated and difficult wildfires. When not fighting wildfires, these crews can be made available for fuel management and landscape FireSmart activities.

7. Ensure sufficient fire behaviour specialist capabilities at Sustainable Resource Development's Provincial Forest Fire Centre as part of wildfire weather forecasting, and implement wildfire occurrence predictions to support the Presuppression Preparedness System.

8. Initiate resource requests in advance of potential demand, especially in anticipation of extreme wildfire risk conditions.

   Efforts should be made to reduce delays inherent in the resource request and sharing system internally and with other agencies.

9. Work with other agencies (e.g., Alberta Municipal Affairs) to develop a structure protection program in which Sustainable Resource Development's role in structural protection is reduced. This will allow Sustainable Resource Development to focus its resources and actions on wildfire containment.

   The intended result is an increased role for municipal fire services to provide sprinkler protection for homes. Key components will be the provision of standardized equipment and training for fire departments and focus on proactive deployment under the mutual aid network.

## COMMUNICATIONS

Communications encompass all dimensions of wildfire management. Sustainable Resource Development's communication challenges are complex. Adopting effective communication strategies to deal with these complexities is of critical importance. The department must have the ability to communicate effectively at all times and be able to meet the communication needs of the public they serve.

*What it Means:*

The Committee reviewed a number of documents that identify Sustainable Resource Development's various communication commitments:

- The fundamental importance of improving both internal and external communication features prominently in Sustainable Resource Development's Wildland Fire Management 2009-2012 Strategic Plan. The department recognizes that it must be inclusive and collaborative in the delivery of its wildfire management program, and that the delivery of wildfire information must be "need-driven and dynamic".

- The Wildfire Prevention 2011-2013 Strategic Plan identifies the FireSmart program as an integral component of its prevention strategy. This commitment to FireSmart led to the development of the "FireSmart Guidebook for Community Protection" (Version 1-2011). The guidebook embraces the principles of community engagement and inter-agency co-operation, which cannot be achieved without implementing effective communication strategies.

- More fundamental guidance relating to communication is found in Sustainable Resource Development's Wildfire Management standard operating procedures.

Both the Chisholm Fire Review Committee (2001) and the 1998 Alberta Fire Review (KPMG) devoted considerable attention to communication. Sustainable Resource Development responded by developing increased communication capacity and a comprehensive communication framework.

In assessing how effectively Sustainable Resource Development's external communication program met the needs of the general public and local government before, during and immediately after the Flat Top Complex, the Committee explored the following questions:

a. How well does Sustainable Resource Development educate the general public about the risk of wildfire and how to mitigate that risk?

   The Committee found that Sustainable Resource Development has implemented various innovative concepts and tools (e.g., community-based social marketing, social media) to reduce human-caused wildfires, improve public awareness and promote mitigation. The Committee believes the FireSmart program is an excellent mechanism to engage the public and local government in identifying and mitigating wildfire-related risk. The Committee was impressed with the FireSmart Community Guidebook that had been developed as a consequence of Sustainable Resource Development's leadership and commitment to the program. While the FireSmart guidebook is new, the FireSmart program is not. The Committee was informed that the FireSmart activities in the Lesser Slave Area were generally limited to vegetation management activities that were routinely initiated by Sustainable Resource Development in collaboration with the Lesser Slave River Regional Fire Service. FireSmart principles promote community engagement as an important component of prevention and mitigating the effects of wildfires. Community engagement is achieved through interaction with the public directly and through elected officials.

   Local governments have a lead role to play in terms of promoting and implementing measures that will protect residents and their communities from the threat of wildfire. They cannot make informed decisions unless they have reliable and accurate information regarding the nature of the threat, and receive advice regarding reasonable precautions that could be taken to mitigate that threat. This information can be provided by Sustainable Resource Development staff. The Committee also believes that Sustainable Resource Development should be proactive in developing relationships with local officials that will facilitate the flow of

reliable information. Sustainable Resource Development promotes this approach, but did not conduct an internal audit or quality assurance process in recent years to ensure the proactive development of these relationships.

b. How well does Sustainable Resource Development inform people during times of crisis of the imminent risk that wildfires pose, and advise people regarding the measures that they should take to ensure personal safety?

During wildfire events, Sustainable Resource Development has a responsibility to ensure that local authorities are properly informed so decisions can be made in a timely manner (e.g., the need for evacuations, or the need to notify the public about health and safety risks). Sustainable Resource Development's wildfire management standard operating procedures are prescriptive and comprehensive in relation to notification protocols when wildfires pose a threat to human health and safety, communities, resources, highways, industrial facilities and other infrastructure in the Forest Protection Area (see Appendix F).

Sustainable Resource Development procedures state that an Incident Commander or Project Fire Manager will contact the Area Duty Officer to advise of imminent danger to a community where evacuations or road closures might be contemplated. The Area Duty Officer is then expected to contact the local municipal disaster services authority to provide information and advice that may lead to road closures and evacuations (see Sustainable Resource Development's Notification Protocol in Appendix F).

The Committee believes Sustainable Resource Development's notification protocols are appropriate; however, the implementation of these protocols during the Flat Top Complex was not complete and led to communication deficits. Notification protocols were successfully implemented during the response to SWF-056; Sustainable Resource Development provided timely advice to the Municipal District of Lesser Slave River regarding the need for evacuations. This process broke down for SWF-065. Ironically, part of this can be attributed to the excellent relationships between Sustainable Resource Development staff and local firefighting services. The Committee concluded that some Sustainable Resource Development staff may have assumed that notifications to the proper authorities were met as a consequence of their tactical interactions with the Lesser Slave River Regional Fire Service. It appeared that they had become reliant on the relationship with one key partner, to the exclusion of others.

As a result, Sustainable Resource Development did not directly provide the appropriate authorities (e.g., RCMP, Town of Slave Lake, and Emergency Operations Centre) with timely situational awareness necessary to facilitate proper assistance in response to the wildfire. For example, the RCMP needed information on the status of the wildfire in order to establish safe evacuation routes and muster points. The Committee recognizes that the rapid development of this incident impacted

response efforts. This issue could have been minimized had a unified incident command framework been practised and implemented. Sustainable Resource Development's Wildland Urban Interface course (S215) teaches students that they should "not wait for the incident to become a crisis before implementing unified command." The Committee believes that this is good policy and should be followed during incidents such as the Flat Top Complex.

The Committee also heard that other elements of external communication during the first two days of the crisis were problematic. The potential fire behaviour implications of the Sustainable Resource Development Fire Weather Advisories, issued for May 14 and May 15, were not provided to local authorities or the public. The Town of Slave Lake and area residents could have used this information to make an informed decision regarding when and if it was prudent to leave the community voluntarily. Discussions with local officials regarding evacuation advisories should have occurred.

c. How well does Sustainable Resource Development keep the public and affected people informed after a wildfire event escalates to crisis status?

Sustainable Resource Development made exceptionally good use of social networking to get information out to the general public and to the media during and after the Flat Top Complex. The social networking tools and outreach efforts that department staff participated in were important measures to help residents make appropriate decisions. 2011 marked the first year that Sustainable Resource Development used social media as an information distribution tool for wildfire information. Both Facebook and Twitter were used extensively during the Flat Top Complex. Sustainable Resource Development reported that before the May 2011 wildfires in the Slave Lake area, the department's Facebook page had less than 200 "likes". During these wildfires, this number grew to more than 21,000 "likes" with a total of more than 50,000 unique viewers. Likewise, Sustainable Resource Development's Twitter followers (which were mostly media) increased substantially to more than 800.

As previously noted, Sustainable Resource Development's communication challenges also included its ability to meet the needs of its employees. Sustainable Resource Development's telecommunications system has the ability to manage multiple events across a number of radio channels; however, at times during the Flat Top Complex, the system was not used as effectively as it could have been which affected communication both on the ground and in the air. The Committee heard that, at times, the radio network was overloaded, making it difficult to contact the duty room.

Some of the communication difficulties were attributable to the fact that air and ground communications for multiple operations within the Lesser Slave Area were initially being coordinated simultaneously out of one duty room. The Incident Command Team assumed control of the Flat Top Complex on the morning of May 15, and was working to establish their

Incident Command Post. During this period, they managed the Flat Top Complex in the same duty room as the Area staff used to manage the other wildfires in the Lesser Slave Area.

The Committee believes there may be opportunities for Sustainable Resource Development to streamline its emergency communications systems to better serve the needs of its employees, the general public and appropriate authorities. The Committee also believes that using alternate technology to track the aircraft fleet, and examining other emergency dispatch models, will provide opportunities for more effective communication during wildfire fighting operations.

**Recommendations:**

10. Enhance standards and training for employees involved in liaison and wildfire management information communications that support operations before, during and after a wildfire event.
11. Issue Fire Weather Advisories that include wildfire behaviour potential to ensure understanding of the wildfire danger.

    Fire Weather Advisories should be more comprehensive in terms of distribution to staff, stakeholders and the public, and more interpretive in terms of implications (i.e., what does the information mean and what actions need to be taken). Fire Weather Advisories are a relatively rare event, which makes it even more important that their meaning is easily understood. Stakeholders and the public need to understand that wildfires can start more easily in certain conditions and, if they do start, can spread very quickly.
12. Undertake a review of Sustainable Resource Development's dispatch and resource tracking systems.

    The Committee believes economies of scale and efficiencies in dispatch and tracking aircraft can be achieved through investment in improved dispatch approaches and technology. Sustainable Resource Development should determine whether other provincially-based emergency and wildfire dispatch methodologies and standards (including training) would be beneficial to its operations.
13. Enhance communication by fully supporting alternative communication technologies (texting, social networking).

## ORGANIZATION AND INCIDENT MANAGEMENT

### *Organization*

Sustainable Resource Development adopted a matrix organizational structure and design in 2006, within which Assistant Deputy Ministers assume responsibilities for both core business and operational delivery. Area Managers are invested with the authority to deliver the full spectrum of Sustainable Resource Development services within their specified geographic area and are expected to make operational decisions within their designated policy and legislative authority.

The reporting structure between Area Managers and Assistant Deputy Ministers has undergone refinements since 2006. Currently, all Area Managers have a line reporting relationship with the Assistant Deputy Minister responsible for Fish and Wildlife/Area Operations. The Assistant Deputy Minister responsible for the Forestry Division has the responsibility for the wildfire management program, but does not exercise line authority for personnel engaged in wildfire operations in Areas.

All wildfire management operations are closely monitored and coordinated through the Provincial Forest Fire Centre. Although firefighting assets reside in specific Areas, they are considered to be provincial assets and are deployed to address provincial wildfire priorities established at the Provincial Forest Fire Centre. These priorities are based on assessments of values at risk. The Assistant Deputy Minister for Forestry, and senior wildfire management officials have the ability to intervene if there are concerns about decisions made in the Areas relating to wildfire management. However, the effectiveness of the interaction seems to be based on strong relationships and the experience of managers, and is less attributable to formal delegations of authority that exist within Sustainable Resource Development.

*What it Means:*

The matrix model has both strengths and weaknesses. It can facilitate better coordination between services within the ministry; it can allow for more flexible and efficient use of scarce resources; and it can provide employees with opportunities for skill development across many disciplines. But the model also has weaknesses. The Committee believes there are considerable benefits to having wildfire management linked with other programs in the department; however, in emergency situations, clear, concise lines of authority are a necessity. In terms of wildland firefighting operations, redundant levels of command authority should be eliminated. The Committee believes the chain of command from the front line firefighter to the most senior official coordinating firefighting at the provincial level should be composed of wildfire professionals.

**Recommendations:**

14. Realign Area wildfire operations to a direct line reporting relationship within Sustainable Resource Development's Forestry Division to provide clearer responsibilities and authorities.

15. Restore regular internal assessments of Provincial and Area implementation of wildfire management strategies, priorities and procedures. Undertake regular reviews and benchmarking of Sustainable Resource Development's wildfire management strategies and firefighting priorities.

## *Incident Management/Incident Command*

The Incident Command System is the template for managing emergency events such as the Flat Top Complex. In major wildfire situations, an Incident Command Team is deployed to the scene and assumes full operational responsibility for the wildfire suppression efforts. The Incident Commander receives a "Letter for Direction" from the Area Forestry Program Manager, which provides instructions regarding reporting relationships and delegations of authority. The Committee believes the implementation of incident management and command during a wildfire can be refined and improved.

*What it Means:*

There were a number of different perspectives that were presented to the Committee about how the Incident Command System was applied or could have been applied during the Flat Top Complex. The Committee believes opportunities for improvement should be considered. As outlined in the Incident Command System training manual, the following conditions will challenge successful implementation of the system:

> *"Weaknesses in incident management can often be attributed to:*
> - *Lack of accountability, including unclear chains of command and supervision;*
> - *Poor communications due to inefficient uses of available communications systems and conflicting codes and terminology;*
> - *Lack of an orderly, systematic planning process;*
> - *No common, flexible, pre-designed management structure that enables commanders to delegate responsibilities and manage workloads efficiently; and*
> - *No pre-defined methods to integrate interagency requirements into the management structure and planning process effectively."*

Within the current Sustainable Resource Development model, the Incident Commander is accountable to the Area Forestry Program Manager so, in effect, becomes a temporary additional asset within the Area's organization. Accountability for wildfire operations is divided between two divisions. Area Managers are accountable to the Assistant Deputy Minister responsible for Fish and Wildlife/Area Operations, while the Provincial Forest Fire Centre and the wildfire management program fall under the authority of the Assistant Deputy Minister responsible for the Forestry Division.

Under the provincial emergency model, local governments exercise the formal authority to declare states of local emergency and order evacuations. Sustainable Resource Development provides information regarding wildfires that will assist local authorities with making informed decisions. In the case of SWF-065, this information did not flow to local authorities in a timely fashion. The evacuation of the Town of Slave Lake was compromised because area highways (Highway 2 west, Highway 2 south, and Highway 88 north) were closed due to the wildfires until early evening on May 15 when Highway 2 south was opened.

Many citizens evacuated their residences only after the wildfire had encroached into the community and homes were on fire. Police officers had insufficient information regarding safe egress routes or safe muster points. Much of what transpired with the evacuation occurred because of individual initiatives and good sense of residents, firefighters on the ground, (both Lesser Slave River Regional Fire Service and Sustainable Resource Development staff) and other emergency responders (e.g., RCMP, Town and Municipal representatives, Government of Alberta staff).

Limited communications between Sustainable Resource Development and local authorities occurred both before and after the "Letter of Direction" was signed to formally institute the Incident Command Team. The responsibility and accountability for external communication resides with the Area Manager. Communications improved after the formalized Emergency Operations Centre and Incident Command framework was implemented on or about May 16.

Sustainable Resource Development provided timely information related to the evacuation of the south shore communities from SWF-056. SWF-056 was a more typical scenario for Sustainable Resource Development in that communities were not in immediate danger, and the department was able to model the growth of the wildfire and develop contingency plans to deal with the situation.

The Incident Command Team members have the requisite training and experience to deal with complex wildfire events. Under the current model, the team is deployed to relieve local Sustainable Resource Development firefighting staff, allowing them to focus on other local priorities and new wildfire starts. These teams understand how incident command operates in a multi-jurisdictional situation. The Lesser Slave Area had extraordinary weather conditions, and multiple wildfires simultaneously threatening many communities, natural resources and infrastructure. Deploying the Incident Command Team was sensible and responsible. Due to the location of the wildfires and the extreme wind conditions that drove the wildfires, there was very little time for the Incident Command Team to be fully established prior to the wildfires entering the communities.

The Committee was informed that operational priorities and wildfire management objectives were confusing, and coordination between ground and air firefighting resources was problematic, during high intensity periods on May 14 and May 15. Multiple operations were being managed out of one duty room in the Slave Lake Fire Centre, and the Flat Top Complex Incident Command Team was still transitioning command responsibility from local staff, when SWF-065 spread into the Town of Slave Lake. Coping with an incident such as this would be more efficiently managed with a coordinated, flexible but efficient command and control environment.

The Committee believes these problems will be addressed if Sustainable Resource Development redesigns its accountability framework for wildfire management. The Committee also believes the Incident Command Team must continue to be supported at the local level with Sustainable Resource Development employees who have developed the relationships that are so critical in times of crisis – relationships with local governments, local

emergency responders and local emergency management personnel. Area management would maintain a liaison role within the incident command model.

The Flat Top Complex provides an excellent example for teaching the Incident Command System, and practising mock emergency exercises in all Areas with other ministries, agencies and stakeholders (other emergency disciplines and jurisdictions in the province). Additional planning and mock execution of evacuations will assist emergency disciplines, stakeholders and the public in implementing effective evacuations.

**Recommendation:**

16. Work with the Alberta Emergency Management Agency to align implementation of the Incident Command System and the use of Incident Management Teams under a consistent provincial model.

    This should include development of appropriate training and emergency simulation exercises that are practised regularly (from tabletop to full simulation exercises related to wildfires).

## POST-WILDFIRE BUSINESS RESUMPTION

The impact of the Flat Top Complex went far beyond damage to physical structures. Critical offices and records were lost and the lives of staff were significantly impacted, which affected Sustainable Resource Development's ability to maintain the same level of services. Immediate contact from Sustainable Resource Development representatives in Edmonton was appreciated; however, the scale of the impacts on government services was more than any one Ministry could resolve. This was recognized by the Government of Alberta, and coordinated efforts were evident.

*What it Means:*

Business continuity plans ensure the continued availability of essential services, operations and programs, including all applicable resources. These plans are activated during, or immediately after an emergency or disruption, and are aimed at permitting the rapid and cost effective resumption of critical functions. It is unclear whether Sustainable Resource Development's business continuity planning included such an extreme event that resulted in loss of facilities as well as available staff.

**Recommendation:**

17. Review Sustainable Resource Development's business continuity plans in the context of overall Government of Alberta plans, with particular attention to loss of department infrastructure and support to staff.

## POLICY, PROCEDURES AND LEGISLATION

During discussions with experts, staff and stakeholders, some challenges associated with policy and legislation have become apparent. In some cases, the policy/legislation needs updating and in other cases there is a need for clarification, communication and/or additional training.

### *Policy and Procedures*

Sustainable Resource Development has a comprehensive set of policies and procedures (see Appendix F for policies and procedures related to this review) that guide staff in performing their duties. The Committee believes some Sustainable Resource Development policies and procedures were not well understood or provided incomplete guidance. In addition to the policy-related recommendations made elsewhere in the report, key areas that were brought to the Committee's attention included:

- The perception of some stakeholders was Sustainable Resource Development does not engage in protecting structures. Sustainable Resource Development policies and procedures provide direction regarding protecting structures. As well, actions during the Flat Top Complex indicate the dedication of the organization and staff in supporting structure protection efforts; however, there were also varying opinions expressed by stakeholders regarding the priority for structure protection and the department's role.

- The perception of some stakeholders was Sustainable Resource Development does not support night-time firefighting. Again, the department's policy is clear regarding when and how night-time firefighting can be carried out, and actions during the Flat Top Complex reflect the intent of that policy.

- Sustainable Resource Development policies on firefighting priorities and initial attack on wildfires can result in varying interpretation.

*What it Means:*

Although the policy environment created by Sustainable Resource Development to guide its organization and staff in dealing with wildfire events is relatively thorough, it is clear that the events of 2011 tested staff ability to implement key policies.

Given the lack of consistency in interpretation of some of the department's existing procedures, the Committee believes Sustainable Resource Development would benefit from a thorough analysis of wildfire policies and procedures (such a review is beyond the capacity and mandated timeframe of this Committee). In addition to the other policy recommendations, the Committee believes particular focus should be given to the areas identified in the following recommendation.

**Recommendation:**

18. Undertake a comprehensive review of Sustainable Resource Development's wildfire policies and associated procedures, especially with regard to priorities, structural firefighting, initial attack, and night-time firefighting, with consideration of staff training and understanding, to ensure consistent interpretation of policies and procedures.

## *Legislation*

The foundational legislation for Sustainable Resource Development wildfire responsibilities, policies, management and operations is the *Forest and Prairie Protection Act*, which came into force in 1971. The legislation is supported by a number of regulations:

- Fire Control Zone Regulation
- Forest and Prairie Protection Regulations, Part I
- Forest and Prairie Protection Regulations, Part II
- Forest Protection Area Regulation
- Forest Protection (Payment for Services, Vehicles and Equipment) Regulation
- Non-permit Areas Regulation

The legislation generally serves the wildfire program and its clients well, although events of 2011 indicate that some sections could benefit from update.

*What it Means:*

Legislation provides the basis for legal responsibilities and authorities. Section 7 in the *Forest and Prairie Protection Act* partially defines relative responsibilities of governments. An extreme event like the Flat Top Complex, which likely foreshadows future wildfire challenges, gives urgency to updating the legislation and regulations for necessary improvements. Clarity of roles and responsibilities is critical to appropriate preparation and response by all parties.

**Recommendation:**

19. Work with legal counsel to review and update the ministry's *Forest and Prairie Protection Act* and associated regulations, in context with other applicable legislation, with particular attention to key areas including, but not limited to agency roles and responsibilities (such as *Forest and Prairie Protection Act* Section 7), evacuation authorities, wildfire investigation, fire control authorizations, administrative penalties, as well as updating definitions.

## RESEARCH AND DEVELOPMENT

There is much to be learned from the May 2011 wildfire events in Alberta. These wildfires had a significant economic and social impact that has yet to be fully understood. Research should be conducted related to the following key areas highlighted by the Flat Top Complex.

FireSmart was initiated as a program in Sustainable Resource Development in 1997 to help protect Albertans living in forested communities from the risk of wildfire. The Sustainable Resource Development FireSmart documents (e.g., The Home Owner's FireSmart Manual, and the FireSmart Guidebook for Community Protection) provide recommended actions for protecting individual properties and communities from wildfires; however, it is likely that the Flat Top Complex presented challenges that were not anticipated (e.g., wind conditions, fuel types) when the guides were developed. It will be important to understand public perceptions of risk, how they are affected by such events, and how they can be encouraged to take mitigation actions to reduce the wildfire risk to themselves. As well, the conditions that emerged were beyond previous wildfire research measurements, creating a significant opportunity to test and adjust wildfire behaviour models. Likewise, the significant efforts to deal with the wildfires can provide insights into what works well and best practices in extreme events.

Another factor is the weather. The wind was critical to what happened, and it should be assessed whether there are forecasting technologies that could be applied in the future to ensure appropriate warnings are extended. The Fire Weather Advisories from Sustainable Resource Development's Provincial Forest Fire Centre for May 13 to 15 provided a general warning that severe winds would be present over a large area of the province. However, it was apparent from staff and stakeholders that the information was not relayed in a manner that generated full appreciation of the imminent risk. A key factor that may have contributed to the level of response is the winds were not expressed in the context of expected impact on wildfire behaviour. As well, there may have been a consideration that, as a broad scale warning, there would likely be variations within the general area and potential for worst case events to occur. Although weather forecasting science and technology has advanced significantly, there are many elements of weather that remain unpredictable.

Sustainable Resource Development has developed a highly sophisticated system to help determine the most effective levels of preparedness on a day-to-day basis. The system links information on wildfire conditions and prescribes resources needed to respond to a wildfire. Other agencies have implemented similar systems that additionally consider the expected number of wildfires (fire occurrence prediction) based on correlation of danger conditions to lightning activity and historical number of human-caused wildfires. Although imperfect, the addition of fire occurrence prediction can be used to expand preparation levels by considering the number of wildfires that are likely to occur.

*What it Means:*

There is considerable research opportunity created by the Flat Top Complex. To ensure Sustainable Resource Development and all agencies associated with protecting communities from wildfire are better prepared, efforts must be made to gain the knowledge needed to apply lessons learned from 2011. There are key pieces of knowledge that could be critical to predicting and responding to such events. The provincial forecast and subsequent alert were reasonably accurate and relevant, and such efforts need to be supported going forward. A more comprehensive weather and wildfire behaviour forecast may have triggered different response efforts by Sustainable Resource Development and its partners. Likewise, efforts to develop FireSmart will benefit greatly from experience gained in 2011. Given the substantial investment and effort needed going forward, it is equally important to monitor the results and gain a clearer understanding of the relative benefits of different treatments and approaches.

These key pieces of knowledge can be applied through the policies and practices of Sustainable Resource Development, and particularly through the Presuppression Preparedness System. Such information can help Sustainable Resource Development, and other agencies associated with protecting human lives and communities from wildfires, be better prepared. For future events, increased preparation levels to account for wildfire behaviour potential and number of wildfires may be used to improve response and success in controlling wildfires.

**Recommendations:**

20. Collaborate with research agencies to support research, development and monitoring in key areas highlighted by the Flat Top Complex including, but not limited to the following:
    - Factors contributing to wildfire threat and structure losses, including wildland and other fuels, social elements, and the contribution of black spruce as a source of extreme wildfire behaviour and spotting;
    - Community planning and development, including codes and standards that impact building materials and fuels in the community;
    - Effectiveness and efficiency of FireSmart treatments and decision support tools for FireSmart investments;
    - Public awareness regarding the potential risk from wildfires and best practices to mitigate this risk, and factors affecting community and resident decisions to implement wildfire risk mitigation activities;
    - Enhanced fuel characterization to provide improved fire behaviour forecasting; and
    - Prediction of wind events, including approaches for worst case probability modeling, in collaboration with Environment Canada; apply lessons learned to forecasting.
21. Enhance the Presuppression Preparedness System to account for new information from 2011 related to initial and expanded attack requirements, with consideration of the potential use of wildfire occurrence prediction.

## Additional Considerations

During discussions with the Committee, stakeholders raised a number of concerns based on information they were aware of in the community, particularly related to SWF-065. One example is that a weather forecast was heard on the morning of May 15 that allegedly indicated upcoming winds gusting to 90 kilometres per hour, which would correlate with the 89 kilometres per hour gusts registered at the airport. The Committee was unable to find corroborating forecast information. The forecast information available from Environment Canada indicated that the forecast gust levels were 70 kilometres per hour, which correlates with the Sustainable Resource Development forecast. There were also concerns expressed that there was no action on SWF-065 overnight, especially using heavy equipment. It was clear from discussions with structural and wildland firefighting staff that there was a significant ground effort during the night of May 14. Staff considered the use of heavy equipment; however, given the challenges with working in darkness in and around homes with safety hazards such as power lines and gas services, that action was limited.

In addition to conflicting information regarding the event, there were a number of stakeholders that expressed opinions regarding opportunities to contain SWF-065 before the winds on the afternoon of May 15 drove the wildfire towards the Town of Slave Lake. Opinions from experienced wildfire specialists ranged considerably, from those who believed extreme strategies could have been implemented successfully, to those who believed the conditions later on May 15 would have overtaken any strategy. In this regard, the Committee considered the following factors:

- First and foremost is firefighter safety, and that certain measures would likely have put lives at risk; and
- Second is that the benefit of hindsight changes the perception of the priorities affecting decisions.

The Committee considered what was known during the night of May 14 and morning of May 15 in the context of threats across the province, the available resources, and whether other decisions could have affected the outcome of SWF-065. The Committee believes that, given the complexity of wildfire threats across the province and the level of experience with events of this magnitude, it is unlikely that any different firefighting actions could have been taken that would have guaranteed a substantially improved outcome without endangering firefighter lives. The experiences gained during the event provide the basis for how to anticipate and react appropriately in such events.

As well, there were opinions expressed that significant alteration of the fuel mix in the Slave Lake area could have had a significant impact. In discussions with fire behaviour specialists, it is possible that complete removal/replacement of the black spruce stand adjacent to Highway 88 would have reduced the impact of SWF-065 as it approached the Town of Slave Lake. It is apparent from a review of SWF-056 that less flammable deciduous stands slowed wildfire spread, and reduced the heat and embers generated from those stands.

# CONCLUSIONS

Alberta was challenged in 2011 with some of the most demanding wildfire conditions documented in Canada's history. The staff of Sustainable Resource Development reacted to the best of their abilities, based on their knowledge, experience and available resources, given the widespread wildfire activity and threats to other communities and other values within the Lesser Slave Area and across the province. The outcome was fortunate in terms of protecting the lives of those at risk in the Town of Slave Lake, Poplar Estates and south shore communities; however, the outcome was unprecedented in Alberta in terms of losses of property and personal possessions of residents, as well as the investments of business and government. The insured loss of over $700 million only measures part of the impact, with significant additional losses that were not insured, and economic losses spread across the province. The emotional and social impacts are immeasurable.

The Committee believes the Flat Top Complex is the strongest warning to date that expanded residential and industrial development in Alberta's wildlands, in combination with increasingly severe wildfire conditions, requires increased focus by fire control organizations (structural and wildfire) as well as stakeholders, communities ,and the public. The impact of these wildfires makes it clear that all parties need to make adjustments to recognize, prepare for, mitigate and respond to wildfires. These actions will help minimize risk to health and safety and reduce damages and losses. Wildfire experts and the Committee agree the risk cannot be completely eliminated, but significant efforts to reduce the risk would be prudent, as the threat accelerates.

It is important to build from what was learned during this event and develop new ways of facing the wildfire challenge. Sustainable Resource Development has a strong history of preparing for fire seasons and situations, and a reputation for quickly adapting concepts and technology. It is now apparent that what has worked in the past will not be enough for the future, given the escalating conditions. It is clear that the dangers presented by wildfire are increasing with more wildfire starts, increased investment across the landscape, and projected climate change shifts. Status quo is not an option.

- With the increasing number and severity of wildfires having the potential to impact human lives and communities, it is clear that wildfire prevention and related communication initiatives must be a priority. As well, the FireSmart program has significant potential to reduce escalating wildfire management costs, as well as reduce the risk that wildfires present to homeowners, communities and business.

- With the increasing workload of more threatening wildfires, Sustainable Resource Development must increase its capacity to respond. Crews and aircraft must be in place, trained and practised early in the fire season, in preparation for potentially high wildfire activity in May. There is a need for larger committed firefighting crews that can take over wildfires when it is clear that initial attack cannot achieve control, or when major threats continue. Sustainable Resource Development must assess and communicate emerging weather conditions with analysis that clearly identifies the wildfire threat. Before firefighting resources are fully committed, the department must be able to backfill with resources from other jurisdictions.

- Sustainable Resource Development needs to work with other agencies in order to reduce its role in structural protection. This will allow the department to focus its resources and actions on wildfire containment.

- The events of May 15 highlighted the importance of good internal communications (within Sustainable Resource Development) and external communications (with Sustainable Resource Development's partners, stakeholders, and the public). Sustainable Resource Development management must stay engaged with local government on emerging and ongoing wildfire threats. Public warnings must provide important information on wildfire threat. Sustainable Resource Development can build on what worked in social media and other common technologies to extend the success in future events. As well, dispatch roles in Sustainable Resource Development will also be enhanced by implementing new technologies and approaches.

- Sustainable Resource Development has undergone a number of organizational changes over the years. The current matrix organization limits the ability to adapt rapidly on a provincial scale. Timely response is dependent on clear and direct lines of reporting, authority and responsibility within the wildfire management program.

- As a key player in emergency response (and dealing with an increasing wildfire emergency potential), Sustainable Resource Development needs to continue to work with the Alberta Emergency Management Agency and the emergency response community to ensure a reasonably consistent and reliable implementation and practice of incident command within the provincial emergency management model. In addition, there were many lessons learned that can be implemented within Sustainable Resource Development's business continuity planning and shared with other agencies in the Government of Alberta.

- The legislative foundation for wildfire management, the *Forest and Prairie Protection Act*, is still largely relevant, but should be updated to clarify responsibilities relative to municipalities, and enhance authorizations supporting wildfire investigations and evacuations. Sustainable Resource Development has a comprehensive policy and procedures framework but further review and training is needed in areas of wildfire priorities, night-time firefighting, and protection of homes and communities.

- There is much to be learned from an event of this magnitude. Research is recommended into what contributed to buildings igniting and how to prevent it; what are incentives for people to take preventative measures; how weather and fire behaviour forecasts can be improved; the most effective FireSmart investments; and improvements to tools to prioritize distribution of firefighting resources.

Although the focus of a review of this nature is on what could have been done better, there is much to be praised in terms of how Sustainable Resource Development responded to the rapid onset of this emergency, with rapid detection and aerial response, quick recognition of the priority, dedicated firefighting resources, and the assignment of a highly qualified Incident Management Team. The final assessment will be in how Sustainable Resource Development is able to move forward and prepare

for future events. The recommendations in this report provide guidance to allow the department to be successful in meeting those expectations.

Of the recommendations contained in this report, some can be achieved within Sustainable Resource Development's authority and budget, and others require enhanced investment, Government of Alberta support, and cooperation of other ministries, levels of government, homeowners and industry. For example, in the case of funding for FireSmart in communities, investment will need to be new, substantial, and sustained. The Committee believes this investment is unavoidable due to the increasing threat of wildfires to communities and public health and safety, and the reality that wildfires can directly inflict many hundreds of millions in property and economic damage in any given year. It is clear that Sustainable Resource Development has placed a high priority on implementing lessons learned from 2011 and initiated substantial changes as a result of feedback from staff reviews, within the limitations of current resources and finances.

The Committee's review provides advice based on the best information available. Implementation of the recommendations will require refinement and adjustment as more becomes known. It is also important to recognize that implementation of several key recommendations will require time and ongoing support. The result will be a safer and more secure Alberta, better able to withstand extremes of future wildfire conditions, thereby minimizing devastating social and economic impacts.

# Desired Future State for Wildfire Management in Alberta

In consideration of the increasing wildfire challenges, the Flat Top Complex Wildfire Review Committee developed the following summary of a desired future state for wildfire prevention, preparedness and response in Alberta. This future state requires increased capabilities for Sustainable Resource Development and an expansion of the roles of its partners. The following are key areas where Sustainable Resource Development and its partners can enhance their capabilities and clarify their roles for future wildfire events. The descriptions outline what wildfire management would look like if all of the Committee's recommendations are implemented.

## *FireSmart*

All municipalities, industries and land managers will assess the risk from wildfire and, where appropriate, complete a Community Wildfire Protection Plan or other appropriate plan, including priorities to treat the most threatening fuels over a reasonable timeframe. Within municipalities, all homeowners will be aware of and act on the Home Owner's FireSmart Guide.

For municipalities, activities will be carried out using a cost-shared model based on ability to contribute, with seed funding provided by the provincial and federal governments. Funds will be managed by the appropriate municipal associations, with monitoring and reporting on rates of treatment relative to provincial priorities.

Success will also rely on significant effectiveness monitoring of planning and activities. Based on a threat analysis of all fuels, it is expected that priority will be placed on thinning and conversion of coniferous fuels, with particular attention to black spruce. Managed use of fire to treat landscape level and local threats expands as needed. Assessment of treatment effectiveness will be supported through research organizations, including comparative analysis of treatments under experimental fire and wildfire conditions from examples across Canada. Results of the ongoing effectiveness monitoring will be used to adjust treatment methods and priorities.

## *Wildfire Prevention*

Given the impact of wildfire activity during the key May period, prevention of wildfires remains a priority, especially during extreme conditions. Using projected wildfire behaviour for the province, Sustainable Resource Development and its partners will provide comprehensive information to its stakeholders and the public, including wildfire behaviour threats, alerting all fire departments, industry and public across all areas of the province affected by potential extreme risks. Fire bans will be issued as necessary, with comprehensive communications to stakeholders and the public, increased enforcement and heightened fines for contravention. Industries operating in the wildland will assume greater responsibility for potential wildfires caused by their operations, through cost-sharing arrangements with Sustainable Resource Development. Financial responsibility will be linked to implementation of emerging wildfire prevention approaches.

### *Wildfire Preparedness*

Aircraft, heavy equipment operators, initial attack crews, expanded attack crews (in-house) will be fully operational well in advance of fire season, having completed training and necessary check procedures. Daily preparation levels will consider wildfire occurrence prediction to ensure the levels of resources correspond to historical levels of wildfire under upcoming conditions, as well as expert advice from staff at all levels. There will be a clear distinction between preparations for initial attack, expanded attack and sustained action resources, with anticipation of the need for each. All resources will be fully mobile to the areas of highest need (current and anticipated) and will fully understand their roles and responsibilities. A portion of firefighting crews will be retained through the year to reduce the turnover and, when not participating in wildfire or prescribed fire activity, will be engaged in FireSmart activities (community and landscape level).

### *Sustainable Resource Development Organization*

The wildfire organization within Sustainable Resource Development will operate with direct line authority from the Provincial Forest Fire Centre to the Areas. There will be continuous monitoring of workload and capacity with rapid resolution of emerging issues, particularly with local capacity. Formal agreements will be in place with Sustainable Resource Development Divisions and Areas for utilization of non-wildfire staff.

### *Other Organizations*

Fire departments across Alberta will be fully trained in S215 (Sustainable Resource Development's Wildland Urban Interface course) and the Incident Command System (with some fire department and other emergency staff certified in Incident Management Team roles). Fire departments fulfill the role of structural protection (including sprinkler systems), and have appropriate equipment and mutual aid agreements to support communities in need. Throughout the fire season, the Alberta Emergency Management Agency will be fully aware, through regular briefings of provincial wildfire risks as they emerge, and have contingency plans to support wildfire emergencies (e.g., Emergency Operations Centres, evacuations). Annual emergency exercises involving wildfire events will be conducted at provincial and local levels (initially tabletop exercises, then a mix of tabletop and full) to ensure the Alberta Emergency Management Agency, communities, and Sustainable Resource Development understand each other's roles, resources and limitations.

### *Policy and Legislation*

The policies of Sustainable Resource Development will support a highly empowered and responsive organization that anticipates and prepares for extreme events. Decision support systems will be available that provide analysis and advise the decision process. Sustainable Resource Development staff understand provincial priorities and their role in major wildfire seasons and interface events, as well as support for non-wildfire emergencies. The legislation supports Sustainable Resource Development in difficult situations (e.g., tactical evacuations).

# ACKNOWLEDGEMENTS


## Sustainable Resource Development Area and Provincial Staff

## Documentation and Technical Support Team Members:

*Records Group – Led by Barry Coleman and John Collins*
- *Carmen Jarrah*
- *Cassandra Roberge*
- *Darren Fearon*
- *Jeremy Bluetchen*

*Wildfire Science Group – Led by Dennis Quintilio*
- *Bob Mazurik*
- *Brian Stocks*
- *Gary Mandrusiak*
- *Mike Flannigan*
- *Nick Nimchuk*

*Wildfire Operations Group – Led by Bruce MacGregor*
- *Morgan Kehr*
- *Rick Arthur*
- *Rob Thorburn*
- *Terry Van Nest*

## Support Personnel:

*Sherra Muldoon, Dennis Quintilio and Associates Inc.*
*(Documentation and Technical Support Team Technical Writing)*

*Colleen Scott*, Priority Solutions & Training Group Inc.
(Flat Top Complex Wildfire Review Committee Technical Writing/Communications)

*Randy Scott*, Priority Solutions & Training Group Inc.
(Flat Top Complex Wildfire Review Committee Focus Group Facilitation)

*Deanna McCullough*, Sustainable Resource Development
(Flat Top Complex Wildfire Review Project Manager)

# APPENDIX A – FLAT TOP COMPLEX WILDFIRE REVIEW COMMITTEE

## Terms of Reference

**Objectives**

- The committee will review Sustainable Resource Development's wildfire management program and budget, relevant policies and legislation.
- The committee will assess information on the wildfire conditions and behaviour for the Flat Top Complex, and the encroachment of wildfire into nearby communities.
- The committee will conduct a comprehensive evaluation of Sustainable Resource Development's wildfire operations for the Flat Top Complex.
- The committee will consult with Alberta government staff, external experts and relevant stakeholders in completing its review.
- The committee will assess Sustainable Resource Development's response to the Chisholm Fire Review Committee Final Report dated October 2001.
- The committee will make recommendations to the Minister of Sustainable Resource Development on how the department can improve its wildfire management program.
- The committee will make recommendations consistent with the committee's Terms of Reference. The committee will not affix culpability.

**Administration**

Sustainable Resource Development will provide the committee with the Flat Top Complex Documentation and Technical Support Team's report, copies of all applicable legislation, policies, and procedures and other available documents and information as required by the committee.

Sustainable Resource Development will provide the committee opportunity to meet with department staff, contractors, other experts and stakeholders to discuss the Flat Top Complex.

Sustainable Resource Development will make available to the review committee the Documentation and Technical Support Team to provide necessary information, support and technical expertise.

Sustainable Resource Development will provide the committee with meeting space, administrative support, and a tour of the Flat Top Complex.

**Reporting**

The committee will report to the Project Manager regarding the Terms of Reference and administrative requirements.

**Committee Members**

The committee is a group of independent, external members consisting of the following:

- William (Bill) Sweeney, Chair
- Bonita (Bonnie) McFarlane, PhD
- Peter Fuglem, M.Sc., RPF (British Columbia)
- Tom Burton

# Committee Member Biographies

### William (Bill) Sweeney – Chair

Mr. Sweeney joined the RCMP in 1974 in Alberta, and retired after completing over 35 years of service. His diverse positions took him to various locations in Canada and included operations, investigations, emergency response, inspections, and analytical and strategic responsibilities. From 2007 until he retired in 2010, Mr. Sweeney was the Senior Deputy Commissioner of the RCMP. He has also served in a variety of executive positions with numerous provincial and national professional associations, committees and boards. Mr. Sweeney was awarded an Officer of the Order of Merit of the Police Forces. He was also a recipient of the RCMP Long Service Medal, the Alberta Centennial Medal, Queen's Jubilee Medal, and is a member of the Order of St. John.

### Bonita (Bonnie) McFarlane, PhD

Dr. McFarlane is the Leader of Fire Social Science Research at Natural Resources Canada, Canadian Forest Service in Edmonton. Dr. McFarlane's research is aimed at informing policy and improving communications. It focuses on perceptions of risk associated with natural disturbance; impact of natural disturbance on forest recreation; factors influencing wildfire mitigation and preparedness at the wildland urban interface; and public perceptions of wildfire management. Dr. McFarlane is an adjunct professor in two departments at the University of Alberta; an Honorary Research Associate at the University of New Brunswick; an associate editor for two international peer reviewed journals; and a member of the Board of Directors of Partners in Protection.

### Peter Fuglem M.Sc.F., RPF

Mr. Fuglem recently retired from a career of almost 40 years in forestry, including over 30 years in wildfire management. His roles have included working on fire control and prescribed burning crews; research in wildfire behaviour; managing policy, technology and legislation development; and serving as Director of the Forest Protection Program in British Columbia from 2002 to 2006. In the latter position, he was involved in the 2003 Firestorm review and implementation of recommendations. Mr. Fuglem was also co-lead on the development of the Canadian Wildland Fire Strategy. He has consulted to various national and international agencies. Mr. Fuglem's education includes a M.Sc.F. in Wildfire Management, with his thesis on extreme spring wildfires in Alberta.

### Tom Burton

Mr. Burton was first elected to the Municipal District of Greenview in 2001, and in 2008 was also elected Director of District 4 of the Alberta Association of Municipal Districts and Counties. Mr. Burton became a member of the DeBolt Fire and Rescue in 1993, and has held the position of Chief since 1995. A registered Emergency Medical Responder since 2001, his experience also includes serving as Chief of the DeBolt Fire and Rescue organization, President of Partners in Protection, and member of the provincial Wildfire Management Advisory Committee. Tom is associated with several other policy and public committees, including the municipal Fire Services Advisory Committee.

# APPENDIX B – STAKEHOLDER OUTREACH PARTICIPANTS

Stakeholder outreach participants met with the Committee in confidence, and those providing input have not been identified in relation to specific comments in this report.

Aircraft Contractors

Emergency Responders

Heavy Equipment Operators

Industry Operators

Municipal District of Lesser Slave River

Sawridge First Nation

Slave Lake & District Chamber of Commerce

Sustainable Resource Development staff

Town of Slave Lake

Wildfire Management Experts

# APPENDIX C – 2001 CHISHOLM FIRE REVIEW AND 1998 ALBERTA FIRE REVIEW (KPMG) RECOMMENDATIONS

## 2001 Chisholm Fire Review

1. SRD take the lead in ensuring communication is a top priority before, during and after fire events by developing and implementing a comprehensive communications plan. The plan should include:
   - Strategies and tactics to actively communicate with Albertans most directly affected by wildland-urban fires, including a media relations component;
   - Education on roles and responsibilities for different stakeholders, including actions property owners should take to reduce the risk of loss;
   - Allowances for more personal communication methods; and
   - Details on interagency communication before a major fire incident.
2. SRD implement means of improving command and resource coordination with MDs, the RCMP, local industries and property owners. This can be accomplished by establishing an integrated and coordinated command system to ensure interagency information and resource sharing and decision-making during complex wildland-urban fires.
3. SRD recognize the need for wildland-urban strategy and tactics separate from those of wildfire suppression. It is recognized that wildland-urban strategy and tactics involve pre-fire preparation to reduce ignition potential within the home ignition zone, and fire response tactics that focus on reducing the potential for a structure to ignite from wildfire.
4. During existing and anticipated extreme fire behaviour conditions, SRD should use other strategies in addition to resource build-up to reduce the occurrence, or impact of large fires.
5. SRD place a high priority on implementing any outstanding recommendations of the KPMG report (Alberta Fire Review, 1998) and review the success of the recommendations implemented before the Chisholm fire incident, in light of and in the context of the Chisholm fire.

## 1998 Alberta Fire Review (KPMG)

1. Undertake an immediate investment in people to increase the level of fire certified staff and individuals available for fire duty.
   - Training opportunities for all forest officer and forester staff.
   - Opportunities for all forest officer and forester staff to gain fireline experience.
   - Mentoring relationships between experienced certified wildfire management specialists and forest officer/forester staff with an aptitude or potential in wildfire management operations.
   - Succession planning/management – identifying individuals with the potential to fill key positions in the future and ensuring that they are given the appropriate training and experience.
2. Increase depth with respect to back-up fireline and support positions resources by:
   - Ensuring that all LFS forest officer, forester and selected management staff receive a base level of training with respect to safety, key wildfire management procedures and common support functions, to enable them to more readily participate in critical fire situations.

- Actively encouraging companies operating within Alberta's forests to make commitments within their respective wildfire management plans to maintain training and certification levels appropriate to the size of their operations.
- Actively developing and maintaining a network of out-of-service fire certified individuals for fireline and overhead positions through seasonal contract opportunities and agreements.

3. Develop training to address the increased desire of the LFS, forest industry and other industry participants to work together during critical fire situations.
4. Promote mentoring in forest wildfire management at the local level as a means of providing on the job training linking formal training and real-life application.
5. Review the guidelines for staff availability during periods of high fire hazard and the degree to which area managers have discretion in adhering to the guidelines.
6. Monitor over-winter weather and fuel conditions monthly.
7. Train all Land and Forest Service staff that are involved in the wildfire management program on the Canadian Forest Fire Danger Rating system and its applicability to fire behaviour.
8. Schedule completion of all fire courses before April 15 each year.
9. Review the current availability of trained, certified firefighting personnel by level and identify gaps created by the 1998 fire season and any adjustments to the field fire organization.
10. The recommendation of the Forest Industry Certification and Training Task Group should be implemented with the forest industry across Alberta.
    - Develop a one or two day fire safety seminar for woodlands personnel, logging contractors, and road building contractors including cat contractors.
    - Track the safety orientation for each employee on the LFS FIRES system to ensure compliance.
    - Deliver the "dozer boss" course at field locations that would involve all sectors.
    - Deliver the "dozer boss" course using LFS certified training contractors or a combination of LFS staff, training contractors and forest industry personnel.
    - Involve company employees and contractors in raising an awareness of the fitness standard for dozer bosses and develop a program to help interested individuals to achieve that standard.
    - Improve the level of standardization of certification for industry staff and LFS staff, as well as for out of province resources.
11. Develop rotary wing and airtanker contract terms that will allow for start up dates that reflect over winter precipitation and anticipated spring fire hazard indices.
12. Audit the method of capturing tower performance data used in 1998. The goal is to confirm or revise the KPMG analysis that indicates a significant decrease in tower performance.
13. Adjust the criteria for selecting start up dates for towers to allow consideration of over winter precipitation and anticipated spring fire hazard indices.
14. Establish an improved or more rigorous phone in protocol for tower people to facilitate flexible start ups and to support Recommendation 13.
15. Initiate a recruitment and training program to staff more of the lookouts with local people to help facilitate flexible early manning.
16. Implement the AAMD&C/LFS, provincially accepted, mutual aid agreement template for MDs and Counties.
17. Create a provincial contract or salary position, for liaison with municipal districts on forest protection.
18. Continue to pursue the Line Task Force recommendation – "To test fire fighting shifts such as 0500hrs to 1700hrs and 1000hrs to 2200hrs in the northern areas of the province."

19. Address occupational health and safety concerns with respect to fireline camp arrangements – enabling increased use of fireline camps on sustained action fire campaigns:
    - Food preparation at fireline camps.
    - Sanitation.
    - Tents/sleeping facilities.
    - Medical evacuation procedures.
20. Develop formal and regular systems for communicating with industry sectors on heavy equipment availability.
21. Continue the use of burnouts and emphasize the following factors when planning/implementing burnouts during fire suppression activities.
    - Ensure the big picture is considered when planning burnouts.
    - Use only experienced and qualified staff.
    - Allow for changes to be made to the burnout plan as conditions dictate.
    - Allow for the participation of the forest industry in planning burnouts when their wood supplies are impacted.
22. Actively solicit forest industry assistance and involve forest industry staff in presuppression planning.
23. Encourage willing participation of industry staff in providing assistance and presuppression planning as required.
24. Establish planned communicative relationships at Provincial and Forest Area levels to ensure a comprehensive understanding of the protection program throughout the year.
25. Continue and expand the industry Liaison Consultant program to ensure accurate and timely exchanges of information and participation by industry in the process of forest protection in Alberta.
26. Continue to incorporate industry staff directly within the wildfire management system in Forest Areas, to ensure timely and expert response to developing fire situations.
27. Develop the planned enhanced radio network (Alberta Firenet) as a priority in the 1999/2000 fiscal year.
28. Complete a detailed accounting of actual equipment losses in 1998, and a review of 1999 equipment levels to ensure that equipment inventories are adequate for subsequent years.
29. Modify the current set of priorities established for the Forest Protection Program to recognize that:
    - Public safety, communities and homes are first priorities.
    - Secondary priorities will be determined on a fire by fire basis considering all other values-at-risk.
30. Form advisory groups to develop formal definitions and other measures for non-financial values-at-risk.
31. Continue to provide a very high level of forest protection across the Forest Protection Area of Alberta recognizing:
    - The large number of communities found in and near Alberta's forests.
    - The very high level of industrial development within the forests.
    - The very high level of timber resource commitment.
32. Delay any movement towards the use of zoning to guide different levels of protection until the financial and non-financial values-at-risk across the province are full evaluated including consideration of extensive input from local or regional advisory groups from affected areas across the province.

33. The government of Alberta should increase the level of base funding for forest protection recognizing that the current level is generally insufficient for funding typical fire season costs and that frequent requests for funding are remitted to the Treasury Board each year.
34. Continue funding the Forest Protection Program from the current mix of revenues – forest industry royalties (through the Emergency Fund), forest protection charges, and if there is a shortfall, general revenues (i.e., taxes).
35. Clear direction for the integration of fire into forest resource management and landscape level planning must be provided and must drive the combination of the practices of wildfire management and forest protection in Alberta.
36. Actively manage for fire in Alberta's forests. LFS should incorporate landscape management into forest management and operational planning by:
    - Sequencing harvests based on susceptibility of timber to fire (not necessarily sequencing harvest of oldest timber first).
    - Modifying existing operational ground rules to reflect regional fuel management needs with the use of landscape management tools.
    - Managing the non-commercial landbase as well as the commercially productive landbase to reduce fire susceptibility.
    - Reducing the partitioning of the landscape through industry partnering (e.g. road sharing agreements, coordination of right of way development, timber harvesting activities and improving the integration of operational plans prior to approval).
37. Incorporate fuel management into forest management and operational planning by:
    - Maintaining an inventory of fuel types, amounts and distribution in high valued areas that are susceptible to fire (identified internally or FMA holders).
    - Projecting the effects of operations on the fuel characteristics.
    - Reducing the amount of fine fuels produced from operations such as logging, thinning, right of way construction and other industrial activities.
38. The LFS should enhance the forest protection organization by creating more direct lines of communication and reporting, by simplifying the command and control structure and by focusing accountability:
    - Reduce administrative boundary conflicts.
    - Create clear lines of authority.
    - Focus accountability.
    - Establish a sound command and control structure.
39. In concert with this organizational change, the LFS needs to increase the number of managers and staff at regional and local field locations in order to manage the delivery and administration of the program.
40. Emphasis must be placed on defining the continuing role of all LFS staff in the Forest Protection Program by defining levels of service to the fire program and by maintaining sufficient numbers of certified fire positions to be available in times of need.
41. Organizational change should be led by a senior manager and group within the LFS who are dedicated full time to the task of designing and implementing the new organization.
42. Develop a culturally-sensitive communication mechanism to develop input and support for Forest Protection Program initiatives that reflect Aboriginal viewpoints and values-at-risk.
43. Support ongoing initiatives to put additional dedicated resources in the Wildland Fire Fighting Units which will serve to facilitate two-way communication locally as well as provide an important organizational tool for coordinating Aboriginal fire crews.
44. Fuel loading and fuel type changes resulting from stand tending operations must be managed very carefully through a more complete set of policies and guidelines for debris disposal and hazard reduction.

45. Strictly enforce hazard reduction requirements on seismic line operations, particularly where breaks in the debris windrows are required.
46. A variable width for power line right-of-ways should be employed for power lines located in forested areas.
47. Place priority on implementing tree freeing plans along power line right-of-ways.
48. Undertake a review of the WFU I and II crew requirements to meet Initial Attack and Presuppression Preparedness System need during peak demand periods.
49. Increase its WFU I and WFU II crew strength by at least 10% for year 2000.
50. Immediately enhance the WFU III program and ensure that at least 3000 WFU III's can be mobilized.
51. Develop incentives for the provision of Initial Attack crews in key areas of FMAs to supplement the provincial crew strength.
52. Call on the Board of Directors of CIFFC to sponsor a national study of crew standards and inventories to address the issue of sharing certified firefighters in a timely fashion under MARS in the year 2000 and beyond.
53. In partnership with the new "Climate Change Central" (created to study and manage the effects of increased levels of greenhouse gases in the atmosphere), the LFS should support ongoing research which uses atmospheric circulation models to study the effects of greenhouse gases, such as carbon dioxide.
54. External to the debate on the relationship of greenhouse gases and climate change, the LFS and the Province should accept that forests are responding to a relative change in climate – despite whether this change is within natural climatic variabilities or not.
55. Support the continued development of a turbine powered fire bomber fleet to ensure orderly and timely conversion to more modern aircraft types.
56. Consider transferring management of provincially-owned aircraft and parts from the new department of Alberta Infrastructure to the Lands and Forest Service, thereby eliminating duplication of administration.

# APPENDIX D – GLOSSARY OF TERMS

| | |
|---|---|
| Airtanker | A fixed-wing aircraft fitted with tanks and equipment for dropping suppressants or retardants on wildfires. |
| CIFFC | The Canadian Interagency Forest Fire Centre provides operational fire control services, as well as management and information services to its member agencies. In addition to coordinating services for all of the provinces and territories, CIFFC often coordinates the sharing of resources with the United States and other countries. |
| Coniferous (conifer) | Cone-bearing trees. Examples include white spruce, black spruce, lodgepole pine, jack pine. Also known as softwood. |
| Contained | Indicates that with currently committed resources, sufficient suppression action has been taken so that the fire is not likely to spread beyond existing or predetermined boundaries under prevailing and forecasted conditions. |
| Contract Staff | Workers under a contract for services, which is an agreement to provide services on a temporary basis. The Contractor is responsible for benefits for his/her employees. |
| Control Line | A comprehensive term for all constructed or natural fire barriers and treated fire perimeter used to control a wildfire. |
| Crown Fire | A fire that advances through the canopy of a forest (a layer of foliage in a forest stand. This most often refers to the uppermost layer of foliage). In other words, an intense wildfire that has taken hold of the treetops and can spread very quickly with the wind. |
| Deciduous | Trees belonging to the botanical group *Angiospermae* with broad leaves that are shed annually. Examples include trembling aspen, balsam poplar and white birch. Also known as hardwood. |
| Dozer | Any tracked vehicle with a front-mounted blade used for exposing mineral soil. |
| Extreme Fire Behaviour | A level of fire behaviour that sometimes precludes any fire suppression action. It usually involves one or more of the following characteristics: high rate of spread and frontal fire intensity, crowning, prolific spotting, presence of large fire whirls, and a well-established convection column. Fires exhibiting such phenomena often behave in an erratic, sometimes dangerous manner. |

| | |
|---|---|
| Fine Fuels | Fuels that readily ignite and are consumed rapidly by fire (cured grass, fallen leaves, needles, small twigs). Dead fine fuels also dry very quickly. |
| Fire Ban | A ministerial order issued by the provincial government to restrict the use of fire in areas of high hazard. The order describes what types of fire are allowed or may in fact entirely prohibit the use of any fire. |
| Fire Behaviour | The manner in which fuel ignites, flame develops and fire spreads and exhibits other related phenomena as determined by the interaction of fuels, weather and topography. |
| Fireguard | A strategically planned barrier, either manually or mechanically constructed, intended to stop or retard the rate of spread of a wildfire, and from which suppression action is carried out to control a wildfire. The construction portion of a control line (also known as Fireline and Fuelbreak). |
| FireSmart® | FireSmart outlines the principles and guidelines for proactive wildfire management. It includes a suite of actions that governments, industry and private property owners can take to reduce their risk. FireSmart includes actions taken to minimize the unwanted effects of wildfire while recognizing fires important role in maintaining healthy landscapes. FireSmart is a registered trademark of Partners in Protection. |
| Forest Protection Area | That portion of the province designated by the Lieutenant Governor in Council under the *Forest Protection Area Regulation*; the majority of Sustainable Resource Development's wildfire management activities occur in the Forest Protection Area. |
| Incident Commander | The individual responsible for the management of all incident operations at the incident site. |
| Incident Command System | A standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries. |
| Incident Management Team (IMT) | The Incident Commander (the individual responsible for the management of all incident operations at the incident site) and appropriate Command and General personnel (e.g., Information Officer) assigned to an incident. |

| | |
|---|---|
| Information Officer | A member of the command staff responsible for interfacing with the public and media or with other agencies requiring information directly from the incident. There is only one Information Officer per incident. The Information Officer may have assistants. |
| Initial Attack | The action taken to halt the spread or potential spread of a wildfire by the first firefighting force to arrive at the wildfire. |
| Limited Liability | Limited liability, in the context of a fire control agreement, is a concept wherein the financial liability of a company for wildfire suppression costs is limited to a fixed sum or portion of the total suppression costs for a wildfire. Companies may enter into a fire control agreement with the provincial government to limit financial costs associated with fighting a wildfire. In exchange for the provincial government limiting a company's share of suppression costs, the company is required to be a partner in prevention of wildfires through company programs, mitigation work, or assisting on wildfires. Limited liability does not protect the company from third party liability or from liability for timber loss or damage. Limited liability is not available for a company if a fire has occurred due to the company's negligence. |
| Mop-up | The act of making a wildfire safe after it is controlled by extinguishing or removing burning material along or near the control line. |
| Out-of-control | A wildfire not responding or only responding on a limited basis to suppression action such that perimeter spread is not contained. |
| Partners in Protection | A coalition of federal, provincial and municipal governments, private industry, non-profit organizations, and others dedicated to raising awareness and providing information that will reduce the risk of wildfire losses at the wildland urban interface. Sustainable Resource Development was one of the founding members, and continues to be a strong supporter of Partners in Protection. |
| Permanent Staff | Employees that provide permanent services on a full- or part-time basis. Permanent staff are entitled to full benefits. |
| Presuppression | The movement and placement of firefighting resources around the forest before and in anticipation of wildfire outbreak. |
| Seasonal Staff | Employees that are hired for full- or part-time employment on a temporary basis. Seasonal/wage staff are entitled to limited benefits. |
| Suppression | The control and limitation of a wildfire's progress once it has started. |

| | |
|---|---|
| Type 1 | Type 1 resource provides a greater overall capability than would be found in a Type 2 resource. Resource typing provides managers with additional information in selecting the best resource for the task. |
| Wildfire Mitigation Strategy | A strategy developed for municipalities exposed to significant wildfire hazard and risks. The strategy outlines the FireSmart activities that, when implemented, can reduce the risk and impact of wildfire. These plans are updated every five years. |
| Wildfire Preparedness Guide | An operational tool that is developed for all communities where wildfire protection is a concern. The guide assists emergency responders with community wildfire protection. This guide is updated annually and is used for immediate wildfire response |
| Wildland Urban Interface | The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. |

# APPENDIX E – REFERENCE DOCUMENTS

The following sources were reviewed in the completion of this report:


Alberta Fire Review'98 Final Report (KPMG, December 13, 1999)

Alberta Forest Protection Policy Manual

British Columbia Firestorm 2003 Provincial Review (January 2004)

Canadian Wildland Fire Strategy: A Vision for an Innovative and Integrated Approach to Managing the Risks (Canadian Council of Forest Ministers, 2005)

Chisholm Fire Review Committee Final Report – Submitted to the Minister of Alberta Sustainable Resource Development (October 2001)

Communicating Wildfire Information, Sustainable Resource Development

*Emergency Management Act*

FireSmart – Protecting your Community from Wildfire, 1999

FireSmart Guidebook for Community Protection – A Guidebook for Wildland/Urban Interface Communities (Government of Alberta)

*Forest and Prairie Protection Act*

Glossary of Forest Management Terms

Ministry of Forests Report to the 2003 Firestorm Provincial Review (Submitted by the Forest Protection Program – January, 2004)

*Municipal Government Act*

Natural Resources Canada - Canadian Forest Service Website

Report of the Expert Panel – Sustainable Resource Development Forest Protection Division's Funding Requirements (September 2003)

SRD Working Together Charter (Sustainable Resource Development, November 6, 2006)

Strategic Plan for Wildland Fire Management in Alberta - 2009-2012 (Sustainable Resource Development)

Sustainable Resource Development Website, Forest Protection section

Wildfire Information Officer Reference Manual (2011)

Wildfire Management Standard Operating Procedures

Wildfire Prevention 2011-2013 Strategic Plan

Wildfire Operations Documentation Report (Flat Top Complex Documentation Team, April 2012)

Wildfire Science Documentation Report (Flat Top Complex Documentation Team, April 2012)

# APPENDIX F – EXCERPTS FROM SUSTAINABLE RESOURCE DEVELOPMENT APPLICABLE POLICIES AND PROCEDURES

# WILDFIRE MANAGEMENT POLICY (January, 2011)

**PROVINCIAL PRIORITY AND RESOURCE ALLOCATION**

The priority for resource allocation and deployment in the Forest Protection Area at all levels shall be based on the following criteria:

1. Human life.
2. Communities.
3. Watershed and Sensitive Soils.
4. Natural Resources.
5. Infrastructure (which has a major impact on public safety or the local economy).

**WILDFIRE PERSONNEL SAFETY**

Firefighter and public safety is the first priority. All wildfire operations and activities must reflect this commitment  Every person is responsible for their own safety, and the safety of others.

Forestry Division must show due diligence in all operations.

**PREVENTION**

To reduce the number and impact of human-caused fires that occur within the Forest Protection Area, despite population growth and escalating fire start potential.

**DETECTION**

Rapidly and accurately detect and report all wildfires that occur within the Forest Protection Area.

**RESPONSE TO WILDFIRES**

All wildfires will be responded to and managed to accomplish specific resource objectives as outlined in plans or Standard Operating Procedures.

Immediate suppression is the objective on all wildfires. Timely and effective initial attack strategies will be used to contain wildfires within the first burning period.

**LANDSCAPE FIRE MANAGEMENT**

To promote, support and provide leadership in the design and implementation of FireSmart Landscapes.

**TRAINING**

To provide appropriate training to all employees involved in the prevention, detection, presuppression or suppression of wildfire.

**COMMUNICATIONS**

To promote the knowledge and understanding of wildfire prevention, detection, presuppression and suppression through internal and external communication and education programs and initiatives.

**REVIEW AND IMPROVEMENT**

Maintain a culture of continuous improvement through constant review of operations and processes, then apply lessons learned.

# WILDFIRE MANAGEMENT STANDARD OPERATING PROCEDURES

## WILDFIRE OPERATIONS PERFORMANCE OBJECTIVES

To ensure the following provincial objectives are met, safe but aggressive initial attack shall be taken on all wildfires within the Forest Protection Area (FPA):

- Initiate wildfire suppression action before the wildfire exceeds two (2) hectares in size, and
- Contain wildfire spread by 1000 hours the following day.

## EARLY MORNING AIRTANKER OPERATIONS

Early morning airtanker operations shall be considered in making presuppression preparedness and operational planning decisions when hazard, potential risk or ongoing wildfire operations dictate. Standto and standdown times shall be set based on the current and forecasted weather and wildfire situation. Early morning operations must be planned well in advance as resources need sufficient rest before commencing the earlier shift. The Rule of Thumb for tanker groups is 10 hours rest between shifts.

## WILDFIRE MANAGEMENT STRATEGY AND PLANNING

**Aggressive initial attack will be done on all new wildfire starts** (except as outlined in the Ecological Wildfire Management Zone (EWMZ) Suppression Matrix). The objective is to have all wildfires contained by 1000 hours the day after initial action.

The management strategies for each wildfire will differ according to the situation and conditions at the time. The prime considerations will be firefighter safety and the provincial priorities. The benefits to a situational approach could be lower suppression costs, freeing up of suppression resources, and the achievement of ecological objectives.

If the wildfire is located within the EWMZ, or in an area with a Wildfire Management Plan in place, those directions will determine the strategy to be followed.

## INTERFACE PROTOCOL

Attempts to protect structures will occur once the Incident Commander has:

- Assessed and confirmed the safety of his crew,
- Evaluated the training and experience levels of his crew, and
- Assessed all the values at risk in the area.

**Structure Fire Protection**: Wildfire Management employees may perform exterior structure and site preparation. This includes suppression of wildfires that are threatening improvements and actions such as foam and water application to exterior structure surfaces and surrounding fuels, fuel removal and burning out around structures.

**Structure Fire Suppression**: Wildfire Management employees may extinguish firebrand ignitions on the exterior of a structure until Municipal fire services arrive.

## NIGHT TIME FIREFIGHTING OPERATIONS

If initial fire action has failed, sustained action efforts must be implemented immediately and aggressively to contain wildfire spread before 1000 hours the following day. Resources will overnight on the wildfire when safe and operationally effective to do so.

A wildfire will be considered safe for overnighting if the conditions of the Safe Night time Operations Matrix have been met.

The following approaches are intended to enhance the success of containing all wildfires within the first burning period. The options can include, but are not limited to:

- Retention of initial attack forces on wildfires until they are extinguished,
- Overnighting firefighters so they are in position to continue firefighting at first light, and
- Actual night time firefighting operations.

Night time firefighting operations can include, but is not limited to the following:

- Construction of dozer line,
- Line support with foam and water units – firefighters, nodwells, skidders, hildebrants, etc.,
- Hose lay, water tank set-up, water source construction,
- Burnout operations,
- Sprinkler deployment and monitoring/maintenance, and
- Camp and other support operations.

## PRESUPPRESSION PLANNING

Consider shifting of resources, early shift for one (1) resource, and late shift for another. Backfill committed support resources as required when anticipating additional wildfire starts.

## SUPPRESSION

It is critical to ensure that overnight operations are considered in the suppression plans, either active work or overnighting in preparation for first light. All resources must be prepared to overnight on wildfires.

When initial attack crews identify mop-up and extinguishment problems, consider replacing them with sustained action crews, especially if additional new starts are expected.

Following completion and approval of an EFAS, resource requirements identified to control the wildfire should be mobilized immediately.

Initial attack resources working on an escaped wildfire shall not leave the wildfire until relieved, or unless otherwise advised by the Area Duty Officer. The Duty Officer should not release initial attack resources from an escaped wildfire until such time as sufficient resources are in place on the fireline and set up to allow continuous, aggressive containment action.

## WILDFIRE DANGER/SUPPRESSION ACTIVITY NOTIFICATION PROTOCOL

Wildfires can be a threat to communities, resources, highways, industrial facilities and other infrastructure. Wildfire suppression activities may also affect industrial installations such as pipeline crossings, power lines or pose safety concerns on highways and roadways. Stakeholders that may be affected by wildfire or wildfire suppression activities must be notified when it is determined they may be affected.

## NOTIFICATION PROTOCOL MATRIX

The Notification Protocol Matrix outlines the process in which internal and external stakeholders shall be notified.

## WILDFIRE EVACUATION

- The Incident Commander or Project Fire Manager shall contact the Area Duty Officer to advise of any imminent danger to community.
- The Area Duty Officer shall contact the local Municipal Disaster Services authority. The Municipal Disaster Services is the lead agency for declaring a state of local emergency, initiating and implementing an evacuation order of residents.
- The Area will assist municipal agencies wherever possible.
- In the event there is no time to advise the appropriate authority of imminent danger the Incident Commander or Project Fire Manager may order an evacuation.
    - The Incident Commander or Project Fire Manager must immediately advise the Area Duty Officer, and
    - The Area Duty Officer must immediately contact the Municipal Disaster Services authority.
- The Area Duty Officer must advise the Forestry Program Manager and Provincial Forest Fire Centre (PFFC) Duty Officer of the current situation as per the Notification Protocol Matrix.
- The PFFC Duty Officer and Forestry Program Manager must advise senior management as per the Notification Protocol Matrix.

## HIGHWAY/ROAD CLOSURE

- The Area Duty Officer shall recommend highway/road closures to Alberta Transportation.
- When a highway closure is necessary, Alberta Transportation is responsible to:
    - Invoke closure,
    - Establish control mechanisms,
    - Take the lead role for arranging additional assistance, (e.g., RCMP),
    - Set up an extended system if required, and
    - Advise the local Municipal Disaster Services authority that a highway closure is in effect.
- If an immediate highway closure is required because of a wildfire threat, it is the responsibility of the Incident Commander, Project Fire Manager or Forestry Program Manager to immediately implement highway closures and notify the proper authorities.

- Until Alberta Transportation can take over highway closure, the Area Duty Officer may request immediate RCMP assistance.
- If a municipal road requires closure, the same process applies, except the authority to close roads lies with the municipality.
- Each Area is responsible to maintain a current emergency contact list.
- The Area Duty Officer shall advise the Forestry Program Manager and PFFC Duty Officer of the current situation as per the Notification Protocol Matrix.
- The PFFC Duty Officer and Forestry Program Manager shall advise senior management as per the Notification Protocol Matrix.

### NOTIFICATION TO INDUSTRY

- In the event of a wildfire threat to industrial facilities or resources, the Area Duty Officer is responsible for contacting personnel at the affected facility immediately. Duty Officer can use the Industry Liaison for this notification.
- Stakeholders may include but are not limited to forest, oil & gas, utilities, communication (microwave, radar sites, cell towers), pipeline transmission, hunting/fishing lodges.
- Each Area shall maintain a current emergency contact list.
- The Area Duty Officer shall advise the Forestry Program Manager and PFFC Duty Officer of current situation as per the Notification Protocol Matrix.
- The PFFC Duty Officer and Forestry Program Manager shall advise senior management as per the Notification Protocol Matrix.

### NOTIFICATION TO MUNICIPALITIES AND LOCAL RESIDENTS

- In the event of wildfire threat, the Area must contact the municipal authority to recommend they enact their disaster plan.
- In the event of wildfire suppression activity, the Area must advise the municipal authority of the current situation.
- The Area and municipal agency are to initiate their communications plan. Through a Wildfire Information Officer, local residents will be advised through face-to-face contact, radio announcements, community meetings, or notification boards placed at strategic locations in the community.
- The Area Duty Officer shall advise the Forestry Program Manager and PFFC Duty Officer of the current situation as per the Notification Protocol Matrix.
- The PFFC Duty Officer and Forestry Program Manager shall advise senior management as per the Notification Protocol Matrix.

### NOTIFICATION OF INTERNAL/DEPARTMENTAL STAKEHOLDERS

- The Area and PFFC Duty Officers shall initiate notification to the Forestry Program Manager and Director of Wildfire Operations for the following incidents:
    - Fire Bans
    - Forest Closures
    - High Hazard

  - Escaped Wildfires / Campaign Wildfires
  - Multiple Fire Start Days (50+ Wildfires)
  - Threat to a Community or Infrastructure
  - Serious Accident, Injury or Fatality
- The Forestry Program Manager must maintain contact with the various PFFC Directors and the Assistant Deputy Minister – immediate and continued communication will eliminate any surprises. Communication of current information is critical.
- As per the Notification Protocol Matrix, the notification protocol for senior departmental officials is as follows:
  - The Assistant Deputy Minister of Forestry Division informs the Deputy Minister of Sustainable Resource Development and the Director of Communications of the need to implement a fire ban.
  - The Deputy Minister informs the Minister of Sustainable Resource Development.

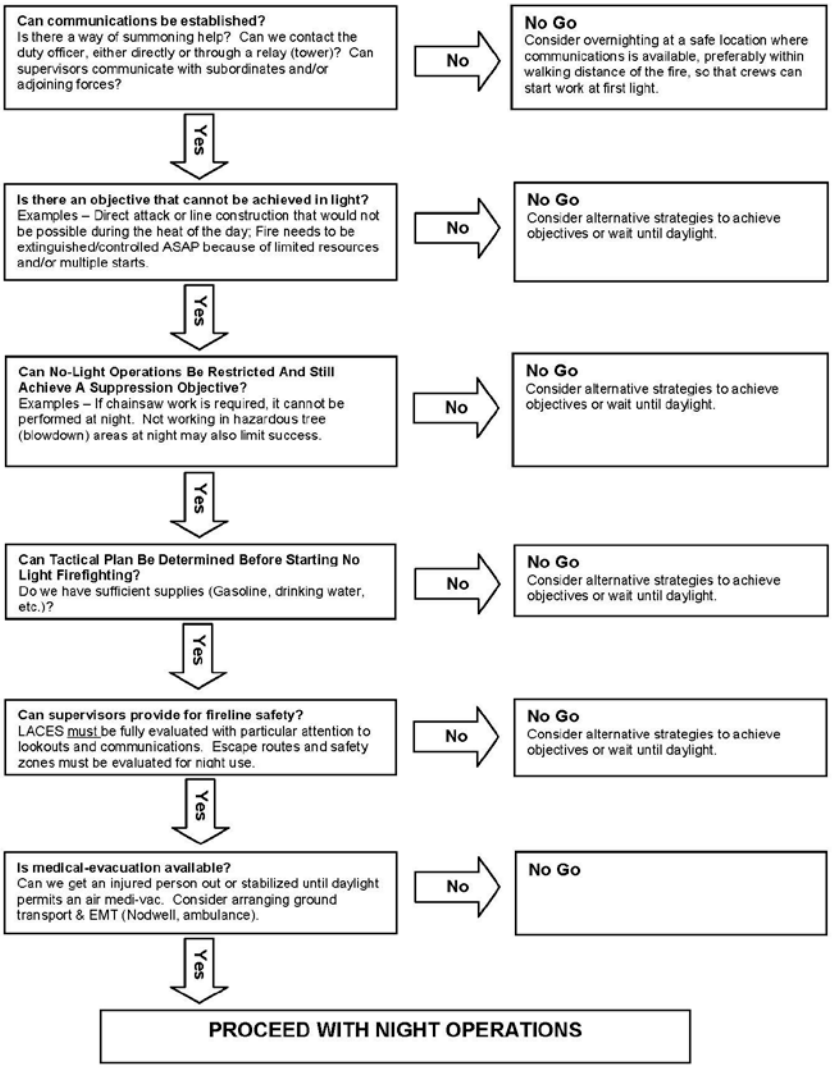
### POOR AIR QUALITY NOTIFICATION

- As per the Notification Protocol Matrix, the Provincial Duty Officer is responsible for poor air quality notification.
- An email to the Air Policy Manager is required based on the Alberta Environment and Water Poor Air Quality Notification Protocol.

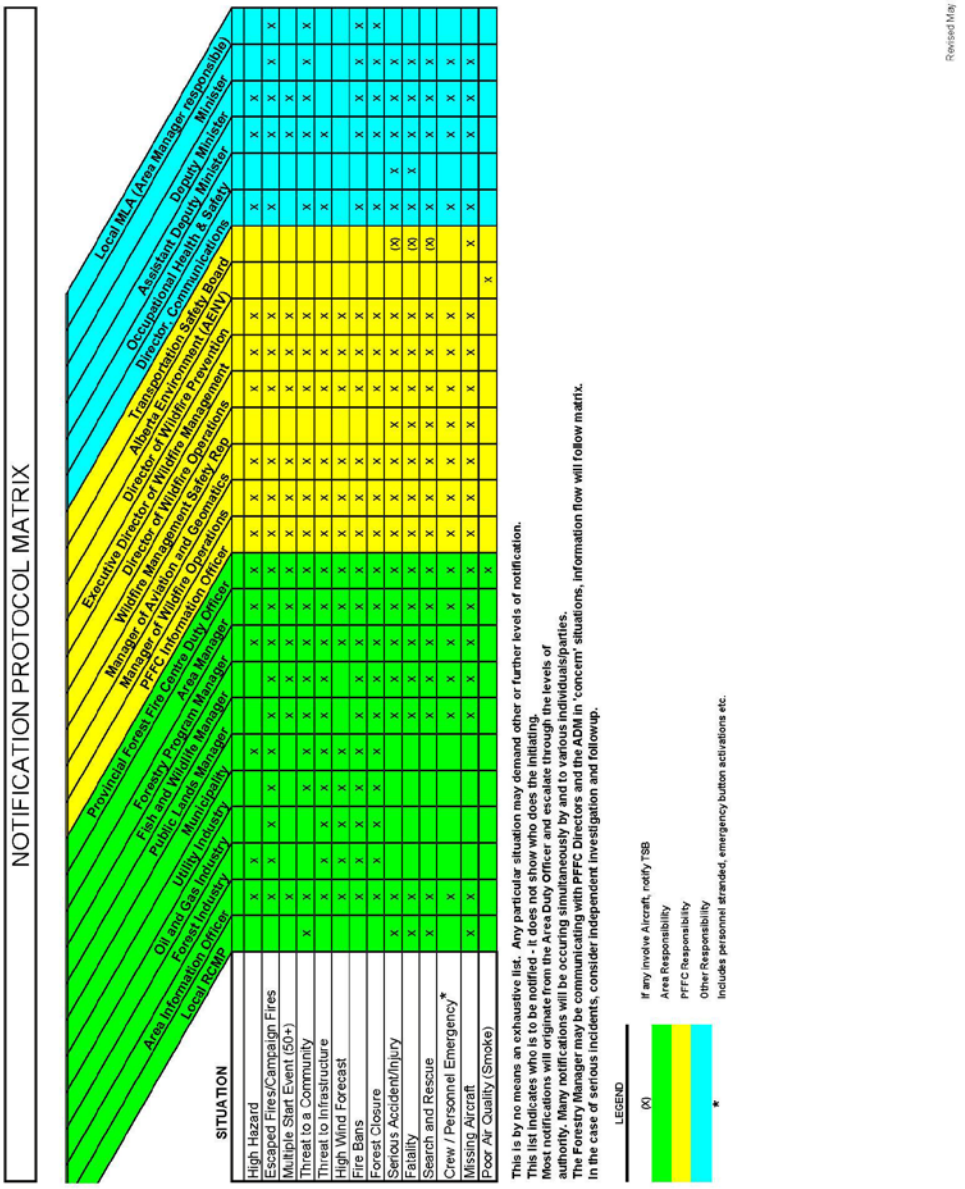
### OPERATIONAL REVIEWS AND CONTINUOUS IMPROVEMENT

Operational reviews are a routine function in a learning culture. Continuous improvement depends on systematic approaches to reviewing activities, documenting the lessons learned from experiences, and translating those lessons into program-wide improvement. The objective is to ensure that programs are being delivered as effectively as possible by reinforcing the use of best practices and implementing improved processes.

## Safe Nighttime Operations Matrix




Wildfire SOP 12 Revised 1 Feb 05



NOTIFICATION PROTOCOL MATRIX

| SITUATION | Area Information Officer | Local RCMP | Forest Industry | Oil and Gas Industry | Utility Industry | Municipality | Public Lands Manager | Fish and Wildlife Manager | Forestry Program Manager | Provincial Forest Fire Centre Duty Officer | Area Manager | PFFC Information Officer | Manager of Wildfire Operations | Manager of Aviation and Geomatics | Manager of Wildfire Management Safety Rep | Wildfire Management Director | Director of Wildfire Operations | Executive Director of Wildfire Management | Alberta Environment (AENV) | Transportation Safety Board | Director, Communications | Occupational Health & Safety | Assistant Deputy Minister | Deputy Minister | Minister | Local MLA (Area Manager responsible) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| High Hazard | | | x | | | | x | | x | x | x | | x | x | | x | x | | x | x | | x | | | x | x |
| Escaped Fires/Campaign Fires | | | x | x | x | x | | x | x | x | x | | x | x | | x | x | | x | x | | | | | x | x |
| Multiple Start Event (50+) | | | x | | | | x | x | x | x | x | | x | x | | x | x | | x | x | | | | | x | x |
| Threat to a Community | x | | x | | | x | x | x | x | x | x | | x | x | | x | x | | x | x | | x | | | x | x |
| Threat to Infrastructure | | | x | x | | x | x | x | x | x | x | | x | x | | x | x | | x | x | | x | | | x | x |
| High Wind Forecast | | | x | x | x | x | | | x | x | x | | x | x | | x | x | | x | x | | | | | | |
| Fire Bans | | | x | x | x | x | | x | x | x | x | | x | x | | x | x | | x | x | | | | | x | x |
| Forest Closure | | | x | x | x | x | | x | x | x | x | | x | x | | x | x | | x | x | | x | | | x | x |
| Serious Accident/Injury | x | | x | | | | | x | x | x | x | | x | x | x | x | x | | x | x | (x) | x | | | x | x |
| Fatality | x | | x | | | | | x | x | x | x | | x | x | x | x | x | | x | x | (x) | x | | | x | x |
| Search and Rescue | x | | x | | | | | x | x | x | x | | x | x | x | x | x | | x | x | (x) | x | | | x | x |
| Crew / Personnel Emergency* | | | x | | | | | x | x | x | x | | x | x | x | x | x | | x | x | | x | | | x | x |
| Missing Aircraft | x | | x | | | | | x | x | x | x | | x | x | x | x | x | | x | x | | x | | | x | x |
| Poor Air Quality (Smoke) | | | | | | | | | | | | x | | | | | | | | | x | | | | | |

This is by no means an exhaustive list. Any particular situation may demand other or further levels of notification.
This list indicates who is to be notified - it does not show who does the initiating.
Most notifications will originate from the Area Duty Officer and escalate through the levels of authority. Many notifications will be occuring simultaneously by and to various individuals/parties.
The Forestry Manager may be communicating with PFFC Directors and the ADM in 'concern' situations, information flow will follow matrix.
In the case of serious incidents, consider independent investigation and follow-up.

LEGEND

(X) If any involve Aircraft, notify TSB
Area Responsibility
PFFC Responsibility
Other Responsibility
* Includes personnel stranded, emergency button activations etc.

Revised May 11

*Note: This protocol was updated for the 2012 fire season. For example, Alberta Emergency Management Agency was added to the Matrix.*

# APPENDIX G – SUSTAINABLE RESOURCE DEVELOPMENT ORGANIZATION STRUCTURE