



Alberta Agriculture and Forestry

Wildfire Management: Processes for Prevention and Review and Improvement

November 2018

About this Audit

Every year, an average of 1,400 wildfires occur in Alberta's forests. The financial impact can be considerable. Aside from the money the province spends on wildfire management (\$294 million in fiscal 2017–2018), wildfires can cause hundreds of millions of dollars of damage, displacing people from their homes and disrupting businesses. The 2011 Flat Top Complex wildfire destroyed 510 homes in Slave Lake and caused \$700 million in damage. The 2016 Horse River wildfire forced the evacuation of 88,000 residents from the Fort McMurray region and destroyed an estimated 2,400 structures. To date the Horse River wildfire is the most expensive disaster in Canada's history, with insured losses of \$3.6 billion.

The Department of Agriculture and Forestry has an established wildfire management program to protect the 39 million hectares of forest in Alberta. The department's wildfire management branch includes provincial headquarters in Edmonton and 10 operational forest areas located across the province.¹ The forest areas coordinate with headquarters to prevent, detect and suppress wildfires in Alberta's forest protection area.

Five activities comprise the department's wildfire-management program:

1. Prevention
2. Detection
3. Pre-suppression preparedness
4. Suppression
5. Review and improvement

Because the external reviews completed after wildfires in 2011 and 2016, and an exceptionally active 2015 fire season, focused extensively on detection, pre-suppression preparedness, and suppression, we scoped our audit on prevention and review and improvement.

Refer to the table on page 2 for a program summary; see Appendix B for a full description of each component. The areas we focused on for the purposes of this audit are highlighted.

¹ These forest areas are: High Level, Slave Lake, Lac La Biche, Whitecourt, Rocky Mountain House, Fort McMurray, Peace River, Grande Prairie, Edson, and Calgary.

Wildfire Management

	Prevention	Detection	Pre-suppression Preparedness	Suppression	Review & Improvement
Inputs	<ul style="list-style-type: none"> • FireSmart • Education • Enforcement 	<ul style="list-style-type: none"> • Staffed lookouts • Aerial patrols • Ground patrols • Public reporting • Lightning detection and monitoring 	<ul style="list-style-type: none"> • Fire weather and wildfire hazard forecasting • Contracting resources (human, material, and support services) • Training 	<ul style="list-style-type: none"> • Firefighting crews • Aerial resources (water tankers, helicopters) • Fire-line equipment • Support services (camps, etc.) 	<ul style="list-style-type: none"> • Standard Operating Procedures (SOPs) • Internal operations and other reviews (Review and Improvement Unit) • External operations reviews
Outputs	<ul style="list-style-type: none"> • Fuel management • FireSmart program: results from community projects • Public-awareness campaigns • Wildfire Prevention Strategic (W.P.S.) plan • <i>Forest and Prairie Protection Act</i> enforcement 	<ul style="list-style-type: none"> • Rapid, accurate wildfire detection and reporting 	<ul style="list-style-type: none"> • Obtain necessary human and equipment resources • Pre-position resources in relation to identified forest-area hazards and risks 	<ul style="list-style-type: none"> • Contain and extinguish wildfires 	<ul style="list-style-type: none"> • Update SOPs • Report results internally and externally • Use wildfire risk-management plans
Short-term Outcomes	<ul style="list-style-type: none"> • Increased public awareness of fire hazards • Reduction of risky behaviour by public, such as leaving camp fires unattended or using OHVs in dry forests 	<ul style="list-style-type: none"> • Early detection of new wildfire starts • Rapid, timely initial attack (human and equipment resources) 	-		<ul style="list-style-type: none"> • Identify and document recommendations and opportunities for improvement
Medium-term Outcomes	<ul style="list-style-type: none"> • Increased public and community awareness of wildfire prevention programs 	<ul style="list-style-type: none"> • Contain and reduce wildfire sizes • Reposition or redeploy resources as required 			<ul style="list-style-type: none"> • Implement recommendations
Long-term Outcomes	<ul style="list-style-type: none"> • Better planning by communities, such as vegetation management • Measurable reduction in number of human-caused (preventable) wildfires • Revised W.P.S. plan based on results analysis 	<ul style="list-style-type: none"> • Wildfires extinguished or contained 			<ul style="list-style-type: none"> • Demonstrated improvements from implemented recommendations • Updated SOPs and processes

Audit Objective and Scope

Our audit objective was to:

- determine if the prevention and review and improvement components of the department's wildfire management program are well designed and working effectively.
- determine if the department has processes to evaluate, implement and report on recommendations and opportunities for improvement from these public reviews:
 - 2011 Flat Top Complex Wildfire Review (Flat Top Complex Wildfire Review Committee): 21 recommendations
 - Wildfire Management Program and the 2015 Fire Season Review: four recommendations; 18 opportunities for improvement
 - 2016 Horse River Wildfire Review: 10 recommendations; 11 opportunities for improvement

Our audit scope was limited to the Department of Agriculture and Forestry and its processes and strategies for wildfire management within the forest protection area for which it is responsible. We did not look at the processes and strategies of other Government of Alberta agencies, such as the Alberta Emergency Management Agency, or municipalities.

We did not duplicate work reported in the three independent external public reviews commissioned by the department since 2011 in the areas of FireSmart, detection, pre-suppression preparedness and suppression.

We performed this audit because wildfire management falls within an area of focus (environmental sustainability) of our office and was identified as an area of risk.

We developed our own criteria for this audit based on our Results Management Framework² and the department's Wildfire Management 2017 Standard Operating Procedures and Business Rules. Department management agreed that our criteria were suitable.

See Appendix A for the audit criteria we applied in our audit.

What We Examined

We examined:

- wildfire management branch documentation, data, analysis and internal reporting between 2014 and 2017 (including documents generated by the forest areas)
- a sample of FireSmart projects between 2014 and 2017
- a sample of internal wildfire operations and program reviews between 2014 and 2017
- the department's Wildfire Management Standard Operating Procedures (SOP) and Business Rules (2017) and adherence to these
- implementation plans and update documents for the 2011, 2015, and 2016 independent external public reviews

² Report of the Auditor General of Alberta—October 2015, page 176.

We interviewed department staff and senior management at wildfire management branch headquarters and the five operational forest areas we conducted site visits at. We also interviewed Forest Resource Improvement Association of Alberta (FRIAA) management.

We conducted our field work from February 2018 to June 2018 and substantially completed our audit on October 2, 2018.

Conclusion

As of June 2018 the department had effective systems and processes for the planning and delivery of its wildfire prevention and review and improvement activities. However, the department needs to improve its systems and processes in the following areas:

- publicly report on its FireSmart programs, including how this work helps reduce wildfire hazard and risk
- measure, monitor and report on the results and effectiveness of the activities set out in its forest areas' wildfire prevention plans
- comply with its business rules for internal results reporting for the review and improvement program
- show implementation timelines or completion target dates in its implementation plans for recommendations and opportunities for improvement from external public reviews against which it can measure and report progress

Why this Conclusion Matters to Albertans

Albertans have experienced devastating losses over the last few years due to wildfires, and studies indicate that future wildfire seasons may become longer and more severe due to climate change.³ Wildfires threaten human lives, communities, natural resources, wildlife habitat, industrial facilities and infrastructure.

The department's wildfire prevention program is designed to reduce human-caused wildfire occurrence and the potential for wildfire loss and damage through a combination of FireSmart, education, and enforcement. The review and improvement program should ensure that the wildfire management program is working as intended through regular internal and periodic external reviews and delivered as effectively as possible.

Albertans should be confident that these programs are working effectively to reduce the risk of wildfire damage and have access to information about how they are meeting this goal. Without appropriate evaluating and reporting of program activities, and results analysis Albertans will not have adequate information to assess whether efforts intended to reduce wildfire risk or improve the wildfire management program are achieving desired results effectively, and if not, what necessary changes need to be made to realize these results. Full public reporting will also enable the department to better showcase to Albertans the important work it is doing around wildfire management.

³ Alberta Wildfire Management Branch Strategic Plan 2017–2019, page 5.

Findings and Recommendations

Department has not been doing results analysis or reporting for some prevention components of the wildfire management program.

Context

Wildfire Prevention

The department's approach to wildfire prevention is based on the principals of FireSmart, education and enforcement.

FireSmart

The department has been formally involved with the practice of FireSmart since 2002, with a goal to mitigate the risk of wildfire threat to Albertans and their communities. The FireSmart program is delivered through:

1. FireSmart activities funded and implemented by the wildfire management branch (directly funded)
2. FireSmart activities funded by the wildfire management branch and administered through the FRIAA⁴ FireSmart program
3. FireSmart activities funded by Indigenous Services Canada (ISC) and implemented by the wildfire management branch through a Wildfire Management Service agreement between ISC and the department

See Appendix C for a more detailed description of these programs. Participation in FireSmart is voluntary; no community or other entity can be compelled to participate in it. Although FireSmart activities can help reduce the risk and effects of wildfires, it does not mean fireproof.

Education

Education, which includes information and outreach, is a key tool for human-caused wildfire prevention. The department uses a number of ways to educate Albertans, such as social media, advertising, and information sessions. Each forest area's prevention plan identifies what educational activities they plan to conduct during the year. Some activities carry over from year to year while others may be new initiatives coming from stakeholders and industry requests.

Enforcement

The department's enforcement program includes components such as investigations, compliance and policy, as well as education. Key compliance tools, such as the fire permit program⁵ and the fire ban system, combined with enforcing legislation, aim to mitigate the number of human-caused wildfires. Under the *Forest and Prairie Protection Act* and associated regulations, the department has a number of tools to ensure compliance with fire permits, including issuing an order to reduce or remove a fire hazard or burning hazard

⁴ Incorporated in 1997, FRIAA is an independent not-for-profit entity authorized by the Minister of Agriculture and Forestry to oversee a number of forestry-related programs, from FireSmart to Mountain Pine Beetle Forest Rehabilitation. The department fully funds the FRIAA-administered FireSmart program.

⁵ Fire permits, issued by the forest areas, are required under Section 18 of the *Forest and Prairie Protection Act* for all outdoor fires lit in the forest protection area during fire season, with the exception of attended fires lit for cooking or warming purposes, flare stacks used in the petroleum industry or as otherwise prescribed by the regulations.

(OTR) or issuing a written warning. Enforcement options include specified fine violation tickets, administrative penalties, cost recovery actions and prosecutions.

Forest Area Wildfire Prevention Plans

Each forest area prepares an annual wildfire prevention plan that establishes objectives, priorities, and activities to mitigate the area's top wildfire causes for the upcoming fire season. These plans strive to reduce the number of human-caused wildfires through education and enforcement activities and reduce the damage from all wildfires through directly funded FireSmart initiatives planned and overseen by forest area staff.

Since each forest area has its own specific variables (vegetation species composition, terrain, infrastructure, types of population centers, etc.) and priorities to consider, each independently decides how its prevention plan will look, what prevention strategies to undertake and how it will complete them.

Criteria: the standards of performance and control

Refer to Appendix A for criteria used for this audit.

Our audit findings

Key Findings

- The department has effective processes to administer and deliver its directly funded and Indigenous Services Canada FireSmart programs.
- The department does not publicly report details on activities for its directly funded and Indigenous Services Canada FireSmart programs, such as a yearly list of approved and completed projects, or the outcomes of completed projects.
- The forest areas are not required to do any year-end summary results analysis or reporting on how effective the various activities set out in their annual wildfire prevention plans were at reducing the risk of wildfire damage, either at the local or departmental level.

FireSmart

Effective processes are in place to deliver department's FireSmart programs

We found that the department has effective processes to administer and deliver its directly funded FireSmart program. Forest area staff identify high-risk communities and Crown land within their area boundaries where FireSmart projects can reduce wildfire hazard and risk; staff submit prioritized project lists to headquarters for approval and funding. We saw examples in all five forest areas we visited where staff worked with communities to identify, develop and get departmental funding for projects such as developing mitigation strategies, wildfire preparedness guides or vegetation management.⁶ Once mitigation strategies and preparedness guides were developed, forest areas continued to support communities in applying for FRIAA funding to undertake FireSmart projects identified in these documents.

We also saw an example where department staff supported local community members who were trying to implement FireSmart principles in the face of opposition from others in that community.

⁶ Typically these were small hamlets, villages or similar population centers that did not have the capacity on their own to meet FRIAA's project application process requirements.

The department has effective processes to administer and deliver the ISC FireSmart program. Under current arrangements the department will continue to administer federal funding support for Indigenous communities on First Nations Reserve lands within the forest protection area until 2025. We saw examples in the forest areas visited where staff identified priority wildfire risk areas and worked with local Indigenous communities to mitigate these threats through developing and executing appropriate FireSmart projects. This also included working with these communities to apply for and secure additional FRIAA funding for eligible projects not covered by the ISC Wildfire Management Services agreement.

Department-funded FRIAA FireSmart program is well administered

We found that FRIAA has well-designed application and project monitoring processes to operate and administer its part of the FireSmart program. We reached this conclusion after reviewing a sample of approved project files and rejected applications. We also noted that in many of the approved projects local department forest area staff had provided letters of support and provided technical assistance to communities for their project applications.

FRIAA has various information available about FireSmart on its website,⁷ such as:

- program description
- summaries of approved projects
- forms and templates for expressions of interest and project applications
- annual reports

The department has sufficient processes to monitor FRIAA's stewardship of the program and compliance with the grant agreement through regular reporting from FRIAA and by having a dedicated manager sitting on its project/application review committee. We found that FRIAA is reporting on the program to the department in accordance with the terms of its grant agreement. The department also tracks approved FRIAA FireSmart projects to ensure projects approved under direct funding and ISC programs are not duplicated.

Lack of Public Reporting by Department on its FireSmart Programs

FRIAA publicly reports summaries of its FireSmart projects and their associated objectives on its website. The department does have general information about FireSmart on the Alberta Wildfire part of its website⁸ and had reported some limited information on the program through various government announcements and brief references in its annual report. The department does not publicly report details on any activities associated with its directly funded or ISC FireSmart programs, such as a yearly list of approved and completed projects by forest area, project-specific funding amounts, communities involved or how completed projects help reduce wildfire hazard and risk. We only saw examples of this type of detailed reporting in internal department reports to various levels of government.

This is information which Albertans should be made aware of so they can better understand the full extent of the department's efforts and expenditures towards wildfire prevention and why specific FireSmart projects were identified and undertaken. This information is especially relevant given the extreme fire seasons Alberta, British Columbia and other jurisdictions have experienced in the past several years.

⁷ <https://friaa.ab.ca>.

⁸ <http://wildfire.alberta.ca>.

No year-end summary results analysis or reporting on annual wildfire prevention plans

The department has processes in place through its wildfire prevention plans to plan and deliver education activities and programs to Albertans and enforce legislation. The department has prepared a three-year provincial prevention plan (2015–2017), and each forest area prepares an annual wildfire prevention plan.

Although forest areas prepare annual wildfire prevention plans, we found they are not required to provide copies of their plans to headquarters. We found no evidence that anyone at headquarters reviewed or provided feedback on these plans or verified that they aligned with the provincial plan.

We also found no evidence that the forest areas do, or are required to do, any summary results analysis or reporting on their annual wildfire prevention plans at the end of the year, either at the local or departmental level. While senior management at the forest areas and headquarters do meet regularly to discuss the progress of various activities set out in the prevention plans, the minutes we reviewed from these meetings did not contain any substantive details.

While we found that the five forest areas we visited tracked details of education activities they delivered throughout the year, they did not conduct any end-of-season analysis to determine:

- what, if any, results were achieved (either empirically or anecdotally)
- if the activities targeted the right audience
- if the activities changed peoples' attitudes and perceptions, thereby reducing the prevalence of human-caused wildfires

We also found the forest areas use different methods to track their education activities. Some use the department's Fire Information Resources Evaluation System (FIRES) database, while others use custom spreadsheets stored on local drives. Without a centrally accessible and standardized way of capturing this information, the department cannot accurately compile a list of delivered educational activities. It also cannot adequately evaluate or report on the effectiveness of these activities towards changing peoples' attitudes and behaviours to reduce the risk of human-caused wildfires.

The department has appropriate processes and staff to enforce the new specified penalty provisions in the *Forest and Prairie Protection Regulation* and *Forest and Prairie Protection (Ministerial) Regulation*.⁹ It currently has 51 staff across all forest areas (a minimum of two per area) who have the requisite peace-officer status to write violation tickets for applicable infractions under this legislation.

The department tracks enforcement activities using the Enforcement and Occurrence Reporting System (ENFOR). This is a dated system which limits how much detail the department can extract for management reports that it could use for results analysis. Forest areas have provided internal updates and knowledge sharing on enforcement activities, but no evaluation or reporting has been completed at this time as to what effect enforcement has had, or is anticipated to have, on reducing the number of human caused wildfires.

Factors such as weather and fire bans can make it difficult to definitively measure the effectiveness of education and enforcement on influencing behaviour and reducing the

⁹ As of May 1, 2017 when *An Act to Modernize Enforcement of Provincial Offences* came into force, along with *Procedures Regulation 63/2017* at the same time.

risk of human-caused wildfires. However, without year-end analysis or reporting, both at the local forest area level and headquarters, the department cannot adequately evaluate:

- which of the various activities set out in prevention plans worked and why
- which ones didn't go as planned and why
- what new or revised activities should be contemplated going forward and why

Without this analysis the department also cannot—and in fact does not—publicly report the results of its education and enforcement activities.

RECOMMENDATION:

Ensure processes in place to evaluate and report on wildfire prevention programs

We recommend that the Department of Agriculture and Forestry:

- publicly report on its FireSmart programs, including how this work helps reduce wildfire hazard and risk
- ensure there are processes in place to measure, monitor and report on the results and effectiveness of the various activities set out in the forest areas' annual wildfire prevention plans

Consequences of not taking action

Without full public reporting on all aspects of the FireSmart program, Albertans cannot tell what work the department is doing on wildfire hazard and risk reduction, why it focuses its efforts where it does, and what work the department is doing to support community-based FireSmart practices. Full public reporting will also enable the department to better explain to Albertans the work it is doing in this area.

Without proper reporting and results analysis, the department will not have adequate information to assess whether the activities and programs carried out by the 10 forest areas as part of their wildfire prevention plans are achieving desired results efficiently and effectively for the public funds spent or what necessary changes need to be made for improvement going forward.

Department is not fully complying with its business rules for internal results reporting for the review and improvement program

Context

Review and Improvement Process

Internal reviews

The department's wildfire management standard operating procedures (SOP) and business rules outline the policies and procedures for conducting internal reviews. These set out that the overall objective of the review and improvement program is to ensure that programs are being delivered as effectively as possible by reinforcing the use of best practices and implementing improved processes.¹⁰ The business rules document the procedures for which types of reviews will be done, how often they will be done, who will conduct them and how results are to be reported internally.

¹⁰ Wildfire Management 2017 Business Rules, Review and Improvement Program Business Rules, page 3.

The branch’s review and improvement unit conducts annual unit reviews of wildfire operations at each of the 10 forest areas (five each year). The purpose of these reviews is to evaluate compliance with the department’s SOPs and business rules. This unit also conducts annual compliance reviews in other wildfire management program areas, such as after-action fire reviews, incident management team assessments, safety officer summary reports and training reviews.

External reviews

Since 2011, the department has commissioned three independent external reviews, from which it received a number of recommendations and opportunities for improvements:

Review	Recommendations
The 2011 Flat Top Complex Wildfire Review (Flat Top Complex Wildfire Review Committee)	21 recommendations
Wildfire Management Program and the 2015 Fire Season Review (MNP)	4 recommendations 18 opportunities for improvement
2016 Horse River Wildfire Review (MNP)	10 recommendations 11 opportunities for improvement

The wildfire management branch tracks the implementation progress of these external reviews’ recommendations and provides internal quarterly updates to management. All three of these reports can be found on the Alberta Wildfire website.¹¹

Criteria: the standards of performance and control

Refer to Appendix A for criteria used for this audit.

Our audit findings

Key Findings

- The department is not fully complying with its business rules for internal results reporting for the review and improvement program.
- The findings of the review and improvement unit is a key part of the department’s annual process of reviewing and updating its wildfire management SOPs and business rules. The only way to ensure that management decisions made during this process are fully informed and evidence based is to ensure all relevant and necessary information is made available through the completed detail reports required by the department’s established business rules.
- The department’s internal implementation plans from the 2015 Fire Season Review and the 2016 Horse River Wildfire Review have no timelines or target completion dates that it could use to measure and report progress or identify problem areas.

¹¹ <http://wildfire.alberta.ca>.

Department is Not Fully Complying with its Business Rules for Internal Reviews

We found the review and improvement unit does evaluate forest areas' adherence to the department's wildfire management SOP and business rules within the prescribed timelines. Management at the five forest areas we visited told us they found value with this process, as it helps keep them accountable and identifies to them where staff are not complying with established rules and procedures. We confirmed the forest areas do implement recommendations for improvement made by the review and improvement unit. The review and improvement unit also posts any common deficiencies it finds across different forest areas on a shared lessons learned site so all staff can be made aware of these in a timely manner.

However, we found that the department is not complying with its business rules for internal results reporting for the review and improvement program. These rules list a number of summary reports (such as a provincial summary¹² and an annual review and improvement summary report¹³) that should be completed annually and who in senior management they should be sent to for review.

For example, the business rules stipulate that the annual review and improvement program summary report will contain important information such as:¹⁴

- type and number of reviews conducted
- key findings
- recommendations for improvements to documentation, such as the SOP Manual, forms, wildfire management manuals
- recommendations for improvements to training
- recommendations for improvements to best practices

We found no evidence that these internal reports were completed or provided to senior management for their review, feedback and approval during the time frame for our audit scope (2014 to 2017). Additionally, minutes from forest area and Edmonton senior management monthly meetings contained insufficient detail for us to determine if management discussed results from review and improvement unit visits. The absence of the information that should be documented in these summary reports hinders the ability of senior management to fully discharge their oversight and decision-making responsibilities.

Improving Implementation Plans for Recommendations from External Reviews

While the department has processes to evaluate, implement and publicly report on the recommendations and opportunities for improvement from its three recent independent external public reviews, there is room for improvement.

The department has developed internal implementation plans for the recommendations and opportunities for improvement from each of the three recent external reviews. It monitors the progress of implementing these through quarterly internal updates to

¹² As set out in the business rules, this summary is supposed to show current-year results for all forest areas reviewed and a results comparison with previous years.

¹³ Summarizes reviews that the review and improvement unit undertakes at forest areas, such as the air tanker programs, rotor wing company safety audits, fire detection lookout audits, reviews of daily flight reports, reviews of wildfire after action reviews and post-fire reviews, prescribed burn reviews, etc.

¹⁴ As set out in the 2017 Wildfire Management Business Rules, Review and Improvement Program Business Rules, page 19.

management. However, recent updates on the 2015 and 2016 reviews we saw did not show implementation timelines or target completion dates for remaining outstanding recommendations, even though there is a spot for these on the update documents. Establishing and documenting these is important, as it helps management better assess how reported progress measures against expected implementation and what, if any, remedial actions may be required to deal with those areas that appear to be moving too slowly. Any public reporting should also include progress of implementation activities against target timelines for each recommendation and opportunity for improvement.

The department has publicly reported on the implementation progress of recommendations for the 2011 and 2016 reviews on its website but has yet to do so for the 2015 fire season report. Management told us that going forward, annual progress updates for all reviews are planned to be publicly posted by December until all recommendations are deemed implemented.

Based on the external-review update documents we reviewed, the status of recommendations is:

- 2011 Flat Top Complex Wildfire review: All 21 recommendations have been implemented.
- 2015 Fire Season Review: One of the four recommendations has been implemented; work on the remaining three is in progress. Of the 18 opportunities for improvement, 11 have been implemented and work on the remaining seven is in progress.
- 2016 Horse River Wildfire review: Eight of the 10 recommendations have been implemented; work on the remaining two is in progress. Of the 11 opportunities for improvement, eight have been implemented and work on the remaining three is in progress.

RECOMMENDATION:

Comply with business rules for internal reviews results reporting and establish and monitor implementation timelines for recommendations from external reviews

We recommend that the Department of Agriculture and Forestry:

- comply with its established business rules for internal results reporting for the review and improvement program
- establish and monitor implementation timelines for recommendations and opportunities for improvement from independent external reviews and publicly report implementation progress against these

Consequences of not taking action

The findings of the review and improvement unit and the feedback it gets from forest area staff during onsite visits is a key part of the department's annual process of reviewing and updating its wildfire management SOP and business rules. These changes have to be ultimately concurred with and approved by senior management, as they affect all aspects of wildfire management. The only way to ensure decisions made are fully informed and evidence based is to have all relevant and necessary information documented and at hand, which can only happen if the reports required by the department's business rules are completed.

Without establishing implementation timelines for the recommendations and opportunities set out in external reviews, department management does not have an effective process to alert them in a timely manner to problem areas which require their attention and intervention. Without public reporting on the progress of implementation activities against target timelines, Albertans will not know if the department is on track to make necessary changes to the wildfire management program and cannot hold the department accountable if it is not on track.

Appendix A:

Audit Criteria

Objective 1: Determine if the prevention and review and improvement components of the department's wildfire management program are well designed and working effectively, focusing primarily on the following:

1.1 Prevention: FireSmart; public education; and enforcement of the *Forest and Prairie Protection Act*, associated regulations, and ministerial orders. The department should have processes to:

1.1.1 Assess, monitor, and publicly report on wildfire risk reduction and benefits from approved FireSmart projects

1.1.2 Plan and deliver wildfire education to Albertans and evaluate and report on the effectiveness of these activities

1.1.3 Enforce applicable wildfire legislation and evaluate and report on the effectiveness of these activities

1.2 Review and improvement: internal program and process reviews of operational aspects of wildfire management conducted by the wildfire management branch. The department should have processes to:

1.2.1 Establish performance measures and targets to assess if results are being achieved

1.2.2 Regularly assess and evaluate wildfire operations (programs, processes and SOPs and business rules) to ensure program objectives are being achieved

1.2.3 Make and implement recommendations to correct deficiencies or shortcomings identified from these assessments and evaluations

1.2.4 Report on the results of wildfire operations evaluations and progress of, and improvements from, implementing recommendations

Objective 2: Determine if the department has processes to evaluate, implement and report on recommendations and opportunities for improvement from previous independent external public reviews the department commissioned. The department should have processes to:

2.1 Plan and evaluate what recommendations the department will implement

2.2 Monitor the progress of implementing recommendations

2.3 Publicly report on the progress of implementing recommendations

Appendix B:

Description of Department's Wildfire Management Components

1. Wildfire prevention

Wildfire prevention is a responsibility all Albertans share. In 2017, the department spent roughly \$30 million on wildfire prevention.

Wildfire prevention is the first line of defense and consists primarily of three approaches:

- **FireSmart programs:** The department's FireSmart program helps to protect Albertans, their homes, communities, vital natural resources and infrastructure from wildfire.¹⁵ Since 2002, the department has formally engaged in community protection through funding FireSmart. FireSmart is a voluntary program consisting of a set of principles and guidelines designed to help reduce wildfire hazard and risk and mitigate the potential for wildfire loss and damage. Although FireSmart activities can help reduce the risks and effects of wildfires, it does not mean fireproof.
- **Education (includes information and outreach):** This is a key tool for wildfire prevention. It is important to develop and communicate prevention activities, as humans have historically caused over 60 per cent of wildfires in Alberta each year.
- **Enforcement:** The objective of the department's wildfire compliance and enforcement program is to decrease the number of human-caused wildfires through compliance actions and enforcement of the *Forest and Prairie Protection Act*, associated regulations, and ministerial orders.

2. Wildfire detection

The department's wildfire operations program is responsible for all activities regarding controlling and extinguishing a wildfire following its detection. It uses a number of methods to detect wildfires, such as manned fire lookouts, public reporting, aerial patrols and infrared scanning.

3. Wildfire pre-suppression preparedness

The objective of the pre-suppression preparedness system is to ensure that the necessary resources are in position to attack and contain newly discovered wildfires. The system consists of four activities:

- fire weather and wildfire hazard forecasting
- resource contracting (for wildland firefighting crews, air resources, and other support services)
- training of wildfire management staff, wildland firefighting crews, and aircraft crews
- pre-positioning of resources in relation to identified wildfire hazards and risks

4. Wildfire suppression

Suppression includes all activities to control and extinguish a wildfire following its detection and includes assigning firefighting crews and equipment (land-based and aerial) to attack, contain and extinguish the wildfire.

¹⁵ See Appendix C for more information about the FireSmart program.

5. Wildfire management review and improvement

The department's review and improvement unit conducts annual internal reviews of wildfire operations at each of the 10 forest areas (five each year). The department has also commissioned independent external reviews after recent major wildfire activity.¹⁶

These reviews identify areas needing improvement and make corresponding recommendations to help ensure the wildfire management program is meeting its goals and expectations.

Appendix C:

FireSmart

FireSmart programs

Agriculture and Forestry's FireSmart program helps protect Albertans, their homes, communities, vital natural resources and infrastructure from wildfire. The FireSmart program is delivered through the following:

- Direct funding from wildfire management branch: Staff at the department's 10 forest areas identify potential FireSmart projects on provincial Crown land (planned and overseen by forest area staff) within their forest area boundaries. Once projects have been approved by headquarters, forest area staff work with stakeholders, including communities, to implement them. Projects are to be completed within that year and are funded from the department's approved FireSmart budget.
- FRIAA FireSmart program: In 2014, the department signed a grant agreement with FRIAA to administer this program, which the department fully funds. All communities within Alberta are eligible to apply for funding through the FRIAA FireSmart program. FRIAA accepts applications twice a year from communities and other eligible parties for FireSmart projects. FRIAA is not responsible for executing projects; however, it does have processes in place to monitor and verify their progress and completion. As of March 31, 2018, the program had funded 64 active projects and 127 completed projects.¹⁷
- ISC Wildfire Management Service Agreement: This program is a cost-recovery agreement between the department and ISC through which forest area staff work with Indigenous communities in the forest protection area to identify, plan and execute FireSmart and other prevention projects on First Nations Reserve lands. The department approves and funds the execution of these projects, for which the federal government reimburses the department up to \$1.5 million per fiscal year. Indigenous communities can also apply to FRIAA for funding for additional FireSmart projects.

FireSmart is based on the following disciplines:

- Planning (e.g. FireSmart community plan: wildfire preparedness guides and wildfire mitigation strategies; resource-sharing and mutual-aid fire control agreements; emergency management plans);
- Vegetation/Fuel management (e.g. fuel breaks, thinning and pruning, vegetation

¹⁶ The three most recent reports included in the scope of this audit are the reports on the 2011 Flat Top Complex wildfire (Slave Lake area), the 2015 fire season and the 2016 Horse River wildfire (Fort McMurray area).

¹⁷ *Forest Resource Improvement Association of Alberta 2017–2018 Annual Report*, page 8.

- removal/reduction and conversion to more fire-resistant species);
- Public education (e.g. increased awareness regarding wildfire threat and application of FireSmart principles);
- Inter-agency cooperation and cross-training;
- Legislation (e.g. review of provincial and municipal legislation, land-use bylaws and plans); and
- Development (e.g. new subdivision development re: roadway access; water supply and utilities placement).

FireSmart activities can range from modifying forest vegetation in the wildland-urban interface to educating residents about steps they should take on their own properties to reduce the wildfire hazard and risk. Activities funded through the FireSmart program aim to create safer communities and healthy landscapes.

For more information, see:

Alberta Wildfire: <http://wildfire.alberta.ca/>

FRIAA FireSmart website: <https://friaa.ab.ca/programs/friaa-firesmart/>

FireSmart annual funding

	2014/2015 (\$)	2015/2016 (\$)	2016/2017 (\$)	2017/2018 (\$)
Direct Funding	1,090,460	1,882,700	679,000	13,500,000
FRIAA	8,000,000	5,000,000	2,500,000	7,500,000
ISC¹⁸	295,516	834,771	2,018,097	1,107,767

Source: Department of Agriculture and Forestry

Actual funding spent for each of the FireSmart programs

	2014/2015 (\$)	2015/2016 (\$)	2016/2017 (\$)	2017/2018 (\$)
Direct Funding	1,178,440	901,575	1,363,767	11,679,427
FRIAA	4,150,147	3,948,984	5,495,795	6,424,113
ISC¹⁸	295,516	834,771	2,018,097	1,107,767

Source: Department of Agriculture and Forestry

¹⁸ Costs are fully recoverable from ISC on an actuals basis; therefore, the ISC FireSmart annual funding will equal the actual funding spent

Appendix D:

Information Charts

Wildfire cause (2007–2017)

Year ²⁰	Human– Caused	% Human	Lightning	% Lightning	Total
2007	784	60	512	40	1296
2008	911	54	779	46	1690
2009	1069	65	566	35	1635
2010	1117	60	740	40	1857
2011	925	81	215	19	1140
2012	1150	73	436	27	1586
2013	914	76	287	24	1201
2014	863	61	562	39	1425
2015	1047	58	772	42	1819
2016	888	63	515	37	1403
2017	815	66	415	34	1230

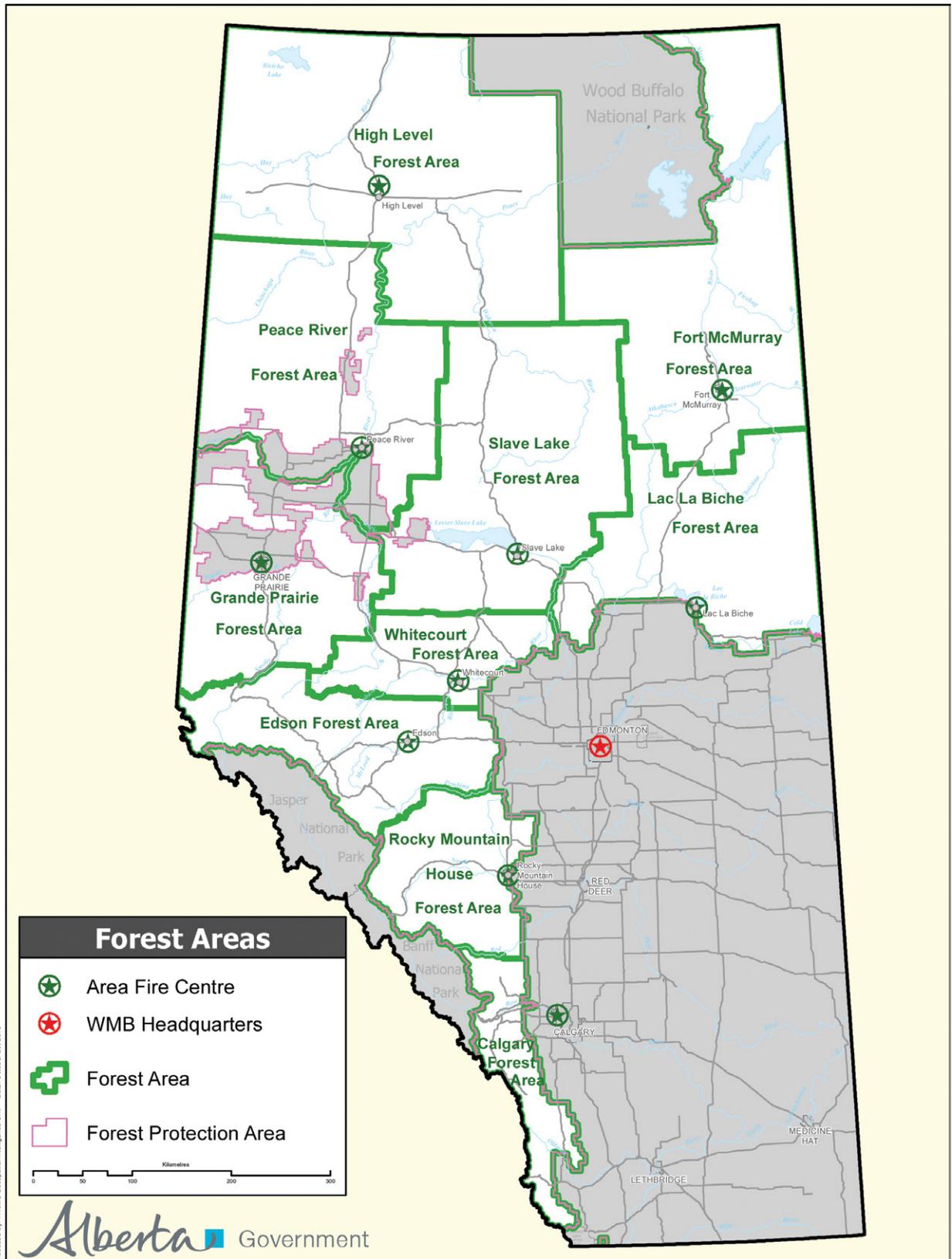
Source: Department of Agriculture and Forestry

Wildfire prevention costs

Year	Information, Education, Outreach (\$)	FireSmart (\$)	Investigations (\$)	Science (\$)	Total of Selected Wildfire Prevention (\$)
2014/2015	1,464,985	10,732,353	795,163	1,122,000	14,114,501
2015/2016	1,930,376	9,258,582	2,573,853	4,162,127	17,924,938
2016/2017	1,582,207	6,501,907	2,326,039	3,059,013	13,469,166
2017/2018	1,472,504	21,344,271	1,618,108	4,657,223	29,092,106

Source: Department of Agriculture and Forestry

²⁰ Time frame for this table is the official fire season, March 1 to October 31.



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