

# Forest Fire Management

Follow-up on VFM Section 3.04, 2006 Annual Report

## Background

The primary responsibility of the Public Safety and Emergency Response Program of the Ministry of Natural Resources (Ministry) is to detect and suppress forest fires on 90 million hectares of Crown land in Ontario and manage the government's aircraft fleet used for forest fire fighting, natural resource management, and passenger transportation for all government ministries.

The number and intensity of fires can fluctuate significantly from year to year, and therefore most program costs are variable in nature. They relate primarily to contracted staff and other expenditures to fight forest fires. In the 2007/08 fiscal year, expenditures of this nature amounted to \$95.1 million (\$66.8 million in 2005/06). Remaining program expenditures for the 2007/08 fiscal year were fixed costs for full-time staff and infrastructure expenditures, and amounted to \$39.9 million (\$36.6 million in 2005/06). Thus, in total, 2007/08 program expenditures were \$135 million (\$103.4 million in 2005/06).

The Ministry is also responsible for managing provincial obligations relating to six other types of hazards: floods; drought/low water; dam failures; erosion; soil and bedrock instability; and emergencies related to crude oil and natural gas production/storage and salt-solution mining.

Our audit in 2006 found that once forest fires were detected, the Ministry had a good track record of effectively suppressing them. However, the Ministry did not have measures for assessing the effectiveness of its procedures for detecting forest fires and, consequently, could not demonstrate that its fire-detection performance was adequate. In addition, although the Ministry had implemented a number of good initiatives to help prevent forest fires, a comprehensive strategy for fire prevention would help focus efforts in this area. Our more significant observations were as follows:

- In the previous five years, the Ministry reported that once a fire was detected, it substantially achieved a 96% success rate in suppressing the fire by noon the next day or limiting its extent. However, fire-suppression costs were still significant when fires were not detected early. We noted two other Canadian jurisdictions that detected two-thirds of fires early through planned methods, in contrast to Ontario, which detected only one-third of all fires through its proactive efforts.
- In 2005, one region noted a significant number of fires caused by railways, and regional staff had directly observed railway workers failing to comply with required practices for fire prevention. This company had caused 36 fires in the 2005 calendar year that cost the Ministry over \$1 million for fire suppression.

- Based on an innovative simulation modelling exercise, the Ministry had implemented a program, beginning in 1999, to reduce fire-fighting costs by better utilizing its resources and optimizing the number of seasonal firefighters and contracted helicopters. Up to the 2005 fire season, the Ministry estimated that this program had achieved savings of over \$23 million. A recent external review had also concluded that the Ministry's aviation fleet was well suited to its requirements and recommended that the government retain the existing aviation delivery model.
- The Ministry had negotiated a favourable price for aviation fuel purchases from two suppliers at various locations throughout the province. However, we found that the Ministry had often paid more than the negotiated price for aviation fuel, and was unable to verify whether the \$4.7 million it had paid for aviation fuel in the 2005/06 fiscal year had been billed correctly.
- The Ministry was assigned responsibility for developing a plan for emergency management of a number of potential hazards, including failed dams and abandoned oil and natural gas wells. The Ministry had found that over 300 dams were high-risk and, if breached, could cause extensive damage. It had also estimated that there could be as many as 50,000 abandoned natural gas and crude oil wells in the province, many of which posed a range of threats, including the build-up of explosive gas or groundwater contamination. Plans for dealing with these threats were being developed but more comprehensive planning was required.

We made a number of recommendations for improvement and received commitments from the Ministry that it would take action to address our concerns.

## Current Status of Recommendations

According to information received from the Ministry, progress had been made in implementing most of our recommendations, with significant progress having been made on several of them. For example, the Ministry had implemented a new fire-detection evaluation process and improved fire investigation and training procedures. More work is still required, however, on several other recommendations, such as implementing a forest fire compliance and prevention strategy, and tracking the cost of aircraft maintenance by individual aircraft.

The current status of action taken on each of the recommendations is described in the following sections.

### FOREST FIRE MANAGEMENT

#### Forest Fire Prediction and Detection

##### Recommendation 1

*To help reduce the cost of fire suppression as well as to achieve its objectives of preventing personal injury, economic loss, and social disruption, the Ministry of Natural Resources should:*

- *formally assess its fire prediction results in order to help refine its prediction model and determine areas for improvement;*
- *consider adopting forest fire detection standards and performance targets;*
- *analyze the reasons for any trends in its fire detection capabilities; and*
- *report on its success in predicting and detecting forest fires.*

##### Current Status

We were informed by the Ministry that a new fire-prediction evaluation process was implemented during the 2008 fire season. Fire predictions are made each day and, for each five-day period, the number of predicted and actual fires was

documented and compared daily at the Ministry's Emergency Operation Centre. A season-end report that summarizes the accuracy of the fire prediction process is to be compiled.

In March 2008, a ministry research project resulted in the development of a new model for establishing wildfire-detection performance targets. Data collected in 2008 is to be used to assess and refine the model.

The Ministry indicated that it will report on trends in fire-detection capabilities once the evaluation of the fire-detection standards and performance targets is complete.

## Forest Fire Response

### Recommendation 2

*To help enhance the information available relating to fire response and suppression and thereby help the Ministry of Natural Resources improve its capabilities in these areas, the Ministry should:*

- *monitor the fire-assessment reports to ensure they are completed when required and that all necessary information is documented; and*
- *develop a method to capture and summarize relevant information from fire-assessment reports and update guidelines to enable meaningful reporting on the sustained-action and response-times performance measures.*

### Current Status

The Ministry reported at the time of our follow-up that procedures for preparing a fire assessment report (FAR) had been added to its Incident Management Team Guidelines. The guidelines specify when a FAR report is required, such as when a fire takes place under unusual circumstances or when it causes serious damage. We were informed that for 2007, there were 28 FARs conducted, and the Ministry noted that improvements were evident in the collected information on the fire responses, firefighting costs, and impact of fires.

With respect to capturing and summarizing relevant information from FARs, the Ministry

indicated that FAR reports were being prepared electronically and would soon be available on a new intranet site. This will permit the sharing of FARs reports with staff.

## Performance Measures for Forest Areas Burned

### Recommendation 3

*To help achieve its objectives of protecting valuable wood supplies and utilizing fire's beneficial effects in resource management, the Ministry of Natural Resources should:*

- *develop processes for identifying areas where fire is necessary for hazard reduction and ecological renewal; and*
- *complete the required plans for fire management for the eight of 11 parks that do not have such plans in place.*

### Current Status

The Ministry reported that in May 2006, new guidelines were issued to help resource managers and fire response personnel identify and finalize the selection of sites for which hazard reduction or ecological objectives could be achieved with managed fires.

We were also told that the use of prescribed fires that are deliberately set by the Ministry to promote ecosystem renewal had been suspended. This decision followed a May 2007 incident in which the program staff were unable to contain a prescribed fire within its intended burn area, which caused unexpected disruption to local businesses and residents. The Ministry told us that it has established a new policy for ensuring that it would be able to contain any future prescribed fires and was in the process of implementing recommendations from a provincial-level review conducted by ministry staff stemming from the incident.

The Ministry informed us that, during 2008, new guidelines and a planning manual would be created for fire management in provincial parks and conservation reserves. The Ministry was also

working with Ontario Parks staff to prioritize fire-management planning requirements and activities for parks. We were informed that as of June 2008, one existing fire-management plan was being rewritten, and work had begun on plans for four other parks. However, a timetable to complete fire-management plans for the remaining parks had not yet been established.

## Fire Investigations and Reviews

### Recommendation 4

*To improve its techniques of fire investigation, help identify recurring causes of fire, assist in fire prevention efforts, and provide a deterrent, the Ministry of Natural Resources should:*

- *take action to resolve any training, documentation, or evidence-gathering weaknesses already identified in the process of fire investigation; and*
- *clearly define the criteria for determining when a fire review at the provincial level is necessary and develop guidelines for the form and content of fire reviews at both provincial and regional levels.*

### Current Status

The Ministry informed us that it had taken a number of steps to improve training, documentation, and evidence-gathering in fire investigation activities. For example:

- current information was shared electronically among advanced fire investigators, and information and investigation forms related to fire investigation had been updated on the Ministry's intranet site; and
- fire investigation training has been updated for crew leaders, a five-day advanced fire investigation course was given to 35 candidates in April 2008, and a one-day annual refresher workshop was being developed for Initial Attack Incident Commanders to ensure that fire investigation skills would be kept current.

The Ministry informed us that the policy regarding the need for fire reviews was revised in October 2007. The updated policy requires a review of all fires responded to by the Ministry, and the level of review is based on the characteristics of a fire. For example, a "provincial-level review" is required for severe fires that are deemed contentious, caused significant damage, or cost a large amount to control. We were informed that a provincial-level review under the new policy was conducted for the May 2007 prescribed fire (previously noted) that the program staff were unable to contain within the intended burn area.

## Forest Fire Prevention

### Recommendation 5

*To help prevent forest fires and ensure appropriate action is taken when fires are caused by human carelessness or repeat offenders, the Ministry of Natural Resources should implement an overall strategy for forest fire prevention that includes:*

- *a specific prevention and compliance strategy for each major type of forest fire caused by humans;*
- *an estimate of the potential costs and benefits of the proposed initiatives to address each type of forest fire caused by humans as well as performance targets for each initiative; and*
- *mechanisms to report on the achievement of results.*

### Current Status

In March 2008, the Ministry prepared a draft research study on the causes and frequency of fires caused by people. However, we understand the Ministry was still studying the issue and had not yet decided on a new prevention and compliance strategy. We were informed that until then, the existing provincial and regional fire compliance strategies, such as education and awareness programs, would be used as the basis for initiatives involving fire prevention.

## Firefighter Training and Safety

### Recommendation 6

To help improve the training of its firefighters and further develop its worker safety initiatives and reporting, the Ministry of Natural Resources should:

- enhance the usefulness of its safety reports by analyzing trends in firefighter injuries in relation to the number and severity of forest fires and number of firefighter days worked; and
- address the identified need for an evaluation methodology to help improve the effectiveness of its training courses for firefighters.

### Current Status

The Ministry informed us that its annual Forest Fire Management Safety Report was enhanced in 2007 by adding lost-time injury rates, injury severity rates, and injury frequency rates. Eight previous years of safety data were included in this report. In addition, the Ministry reported that it had canvassed other provinces and territories for lost-time injury statistics; however, useful comparisons were difficult to make because there were differences in data collection. The Ministry's safety working group has recommended that the association representing Canadian firefighting jurisdictions examine the feasibility of a common method of collecting and reporting data on lost-time injuries.

The Ministry informed us that a new assessment model for planning, developing, and administering firefighter training and testing had been developed and was in use for training programs delivered in 2008.

## Fire Management Costs, Revenue, and Inventory

### Recommendation 7

To help ensure that forest fire management is operated in the most economical manner, the Ministry of Natural Resources should:

- review the costs and benefits of formally continuing with its cost-management program and

reporting annually on the achievement of any cost-saving initiatives;

- establish a shorter timeframe for invoicing costs for fire suppression and assess the merits of alternative courses of action to help improve the collection of outstanding invoices; and
- dispose of obsolete inventory on a timely basis.

### Current Status

The Ministry informed us that, in March 2007, a new policy was established that formally continues the cost-management program referred to as "Total Cost Management." It indicated that the principles and concepts of the program are part of an organizational culture that strives to operate forest fire management at the required level of protection described in the Forest Fire Management Strategy for Ontario at the least total cost to the government. No reporting has been established for this program; however, any initiatives for increasing efficiencies and reducing costs are to be reported as part of the annual business-planning process and a new branch-wide report card that would be available to staff in 2009.

Our discussions with the Ministry did not identify any substantial changes made by the Ministry to improve invoicing and collection of fire-suppression costs.

The Ministry told us that increased efforts and staff additions had been made to manage inventory better, and that inventory was being reviewed regularly and redundant and obsolete items disposed of.

## AVIATION SERVICES

### Aviation Services Costs

### Recommendation 8

To help improve its operational efficiency and deliver aviation services in the most cost-effective manner, the Ministry of Natural Resources should:

- dispose of unused aircraft through sale or trade;
- track cost of maintenance downtime, engineering, and parts by individual aircraft to help

*objectively determine fleet-replacement requirements; and*

- *implement procedures to ensure it pays the negotiated price for aviation fuel.*

### Current Status

The Ministry informed us that its four unused aircraft were either traded in or sold, thus permitting upgrades of other aircraft from the proceeds.

The Ministry was still investigating upgrades for its information system to allow for automated tracking of maintenance hours and parts costs for each aircraft. We were informed that in the interim, a manual process had been adopted to track the time spent by aircraft maintenance staff on each aircraft.

The Ministry told us that, although it had established processes for verifying fuel invoices, it often had difficulty obtaining the necessary invoice details from its large suppliers. One supplier had agreed to provide detailed invoices, which allow for periodic checks of fuel prices; the other supplier would not provide detailed invoices, but its contract with the Ministry has since expired. After a recent unsuccessful tender to replace this supplier, most fuel purchases are no longer covered by a price agreement.

## Aviation Safety Inspections and Audits

### Recommendation 9

*To ensure that all commercial aircraft contractors meet and continue to meet provincial requirements for aviation safety, the Ministry of Natural Resources should:*

- *implement record retention policies for documentation related to commercial carrier inspections, audits, and information updates;*
- *outline circumstances that require commercial carriers to submit information regarding significant changes to their operations; and*

- *consider a risk-based program of periodic tractor safety inspections.*

### Current Status

The Ministry reported that it had developed a draft policy, for implementation by the end of 2008, that addressed the requirements for documentation of commercial carrier inspections, audits, and information updates. The Ministry planned to notify current eligible carriers of the new policy when it was final. In addition, the capacity to store and access this information on-line was being developed.

The Ministry informed us that by the end of the 2008/09 fiscal year, it would begin testing a risk-based approach to determining which commercial carriers warranted a safety inspection.

## Emergency Management

### Recommendation 10

*To ensure that its legislative responsibilities for emergency management are being fulfilled and to protect people, property, and the environment from the natural and human-caused hazards for which it has been assigned responsibility, the Ministry of Natural Resources should:*

- *work with Emergency Management Ontario to complete the required enhanced and comprehensive levels of emergency planning; and*
- *develop a comprehensive emergency-simulation program to test the effectiveness of various components of its emergency plans.*

### Current Status

The Ministry told us that it was committed to developing a “fully comprehensive” level of its emergency management program by March of 2010. The Ministry had been consulting with Emergency Management Ontario to finalize the program. A five-year action plan has also been developed that includes an emergency simulation exercise.