

**Fire Load and Resource Capacity Survey Overview**  
**For the Wildland Fire Management Working Group**

**March 30, 2012**

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**Purpose of the Survey and methodology:**

This Survey is part of the Wildland Fire Management Working Group (WFMWG) 2011/12 Workplan Element 1: Development of a strategic approach to address the risk of increasing fire load and resource sharing challenges in Canada.

The role of the WFMWG is to provide policy advice and strategic guidance to the Canadian Council of Forest Ministers (CCFM) on the subject of wildland fire management in Canada. In 2011/12 the WFMWG developed a working partnership with the Canadian Interagency Forest Fire Centre (CIFFC) and its Council of Directors to address forest fire management issues of mutual concern.

The objective of this Survey is focussed on quantifying recent trends and the current situation faced by Canadian fire management agencies in terms of fire load (numbers of fires, area burned, expenditures, values at risk) and resource capacity. The Resource Sharing Task Team (RSTT), a subset of the CIFFC Resource Management Working Group, was formed to work with the Consultant to gather existing data, conduct agency surveys and prepare a report and analysis of recent trends, current status and the forecast situation related to resource inventory/capacity and fire load.

After the contract award (January 26, 2012) the Consultant teleconferenced with the Resource Sharing Task Team contacts (Serge Poulin, Bruce Macnab, and Paul Ward) on January 27, 2012. This group provided direction and oversight to the Consultant over the term of the contract.

All agencies had been contacted by CIFFC and provided with a blank copy of the Survey spreadsheet and asked to provide a completed copy by February 24<sup>th</sup> initially. This date was later revised to February 29<sup>th</sup>.

The Consultant met with Ontario staff on January 30, 2012 for a first run through of the data collection spreadsheet. A three question interview process was established for subsequent conference calls with all agencies:

- to discuss the data gathering process;
- solicit any recent reports about fire load and resource capacity that agencies may have developed and;
- to gather any preliminary trend information from agencies for the recent past as well as anticipated impacts for the future.

The results of the Survey are reported in three documents produced for this project (Fire Load and Resource Capacity Survey Agency Response Analysis and Summary, Preliminary Trends Noted by

Agencies during Data Gathering Stage and Other Reports or Analysis Noted by Agencies During Data Gathering Stage).

All agencies were interviewed initially between January 30 and February 14, 2012.

Once data sets started to become available the Consultant reviewed the data to help understand the data and to look for anomalies. Questions and answers were exchanged with agencies through email and phone conversations to improve the data over the contract period.

The results of the data gathering process were documented and information was provided for each of the approximately 200 data elements for the data sets provided by March 16, 2012.

Data elements were grouped into like categories. For each data element grouping a summary chart was provided that includes:

- whether the data could be collected and for what period of time;
- how the data element was collected by each agency (units, classification systems etc.);
- whether the agency broke the data elements down further (by response zone or component costs)
- initial comments on data element results, and utility and;
- initial identification of any trends if evident .

This data elements analysis is recorded in the appendix document Resource Capacity Survey Agency Response Analysis and Summary.

For each data element there is also a section for any additional information gathered about the data element and recommendations for the future collection and analysis of the data element.

**Response to the Survey:**

As of March 16, 2012 the data gathering and correction process was still ongoing. Two agencies had yet to provide any data and several had provided interim incomplete data sets with work ongoing to provide a final version.

Many agencies reported challenges to gathering the data sets back even 10 years. Challenging issues included:

- a shortage of staff to gather data, especially at the time of year (January, February). (Some agencies reported they may be able to add to their data sets by assigning tasks to staff hired for the 2012 fire season.)
- The limited time period set for collecting the data (30-45 days).
- Data is collected by different parts of the organization (Regional versus Headquarters) and was difficult to bring together into agency reports.
- Some data elements are collected in a variety of standards outside the fire organization and are not available or not easily available (e.g., Evacuation data).
- Information management systems have been upgraded but historical data did not migrate into upgraded systems or is not consistent with current data standards. If available this will need additional data searching, clean up and analysis.

The following agency data sets were as complete as they could be for this project (in some cases data was not available or not available for at least 10 years):

Alberta, Quebec, New Brunswick, Newfoundland and Labrador, Northwest Territories, Parks Canada, the Canadian Interagency Forest Fire Centre (CIFFC) and Natural Resources Canada (NRCAN).

The following agency data sets were almost as complete as they could be but had outstanding data gathering, clarification or data correction to provide:

Manitoba, Ontario, Saskatchewan, British Columbia and Nova Scotia.

The Yukon and Prince Edward Island have been unable to provide any data but did provide input into the trends and other report sections of the project during the initial agency interview stage.

There have been challenges to analyzing the data within the period of the contract. In addition to the delayed data availability, the missing data and the data clean up, the submission of the data in fifteen individual agency, CIFFC and NRCAN spreadsheets provided a challenge to analyze the data for national summaries.

This national analysis was additionally challenged because of different standards currently in place for agencies. In the interest of time and to gather information about agency standards used, agencies were asked to provide their data in their own standard. The most extreme example of multiple standards is how agencies classify or type fires. About half the agencies reported they did not classify their fires while 6 reported that they did. For those that did there were 4 different size classifications and 4 different type classifications and one agency used both a size and a type classification.

Agencies were also encouraged to break down their data further if they had the data available and this was done by adding additional columns to their spreadsheets. For example, some agencies have demarcated full response zones and modified response and/or observation zones, and subdivide data such as numbers of fires and area burned based on these zones.

Except for the data collected by CIFFC daily and annually, fire load and resource capacity data is collected nationally on an ad hoc basis rather than on a regular annual basis. The farther into the past that data is required the harder it is to find on an ad hoc basis. There is not a common information system in place to gather this information on a regular basis to provide analysis to senior managers.

#### Recommendations:

- Provide agencies with an additional period of time to gather missing data through the 2012 fire season when many have additional staff available who could be assigned this task.
- Develop a national standard for those data elements that don't currently have a common one to improve the ability to produce national analyses.
- The individual agency datasets gathered for this project and improved over the next season should be gathered into one national dataset for a next round of trend analysis and a national repository of this type of data should be developed for annual data collection and analysis.

### **Summary of agency comments on important trends and concerns**

Agencies were asked to identify any trends they have seen in the past 10+ years in their fire load and resource capacity that might be confirmed through analysis of data provided. Agencies were also asked to identify future impacts to fire load and resource capacity.

Detailed agency responses to these questions are recorded in the appendix document Preliminary Trends Noted by Agencies During Data Gathering Stage

Agency trends were sorted into **key trend** categories. An assessment was made about whether data elements were being collected to verify these trends. For trends that required simple trend analysis an initial trend was indicated. Recommendations were made for further analysis. Because of the delay in data availability further analysis is required for many trends.

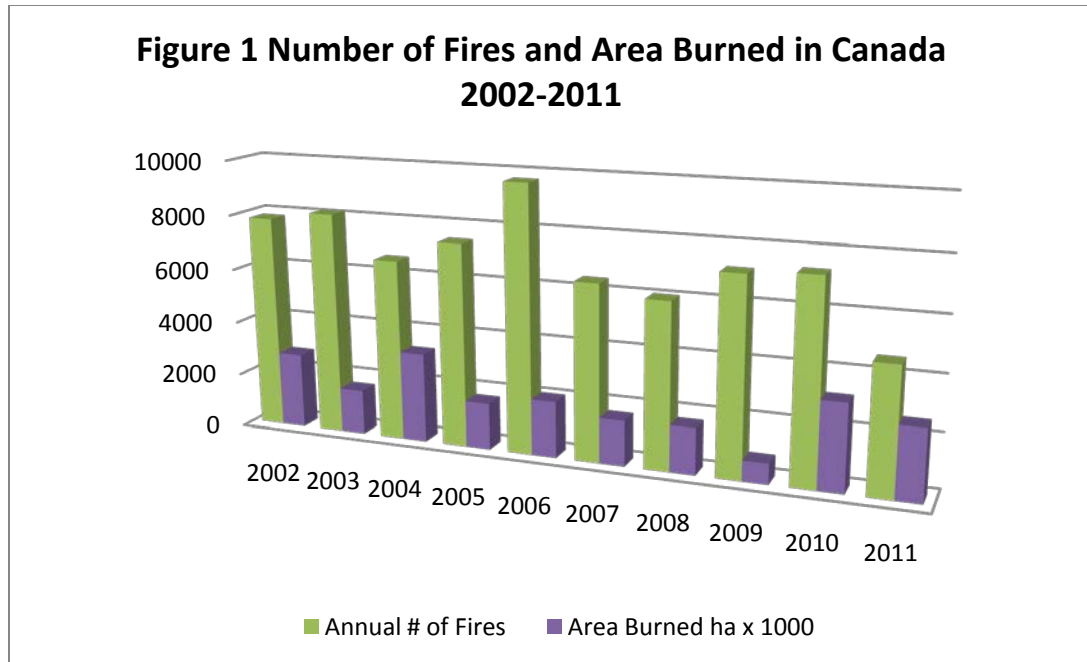
It should be noted that initially it was hoped that trends could be examined over at least the 20-year period from 1992-2011; however, for many of the data elements, data was so sparse prior to the year 2000 that a two-decade analysis was generally not feasible. As will be seen in the subsequent tables, even for the most recent period from 2001-2011, it was not possible to compile a single complete dataset for any one data element from among all of the agencies which did respond to the survey.

### **Key agency identified trends - Fire Load**

Increasing **Season Length** was identified as a change from the past. Most agencies provided data for the date of first and last reported fire of the season. This data element can be used to confirm the trend, however several agencies reported fires in every month of the year and further refinement of this data element is required to better represent its impact on resource capacity. Improvements could include how season length has extended the operating season of key fire centres, the contracts for key resources (fire fighters and aircraft) or the period of time or number of days key resources were on alerts or on elevated alerts.

Most agencies identified **Seasonal Variation** trends that included changes to fire/area burned numbers but not a clear trend with some agencies increasing while others are declining. There continues to be a significant variation temporally and geographically in fire impacts. Although there is some suggestion that regionally we may be seeing an increasing overall trend in fire numbers and area burned in the west, and a decrease in the eastern half of the country, this issue requires additional analysis.

The data collected for this Survey when added to previous analysis reported by Stocks (2010) continues to support “the highly episodic nature of area burned in Canada, with significant fire years interspersed with relatively quiet years...”(Figure 1).



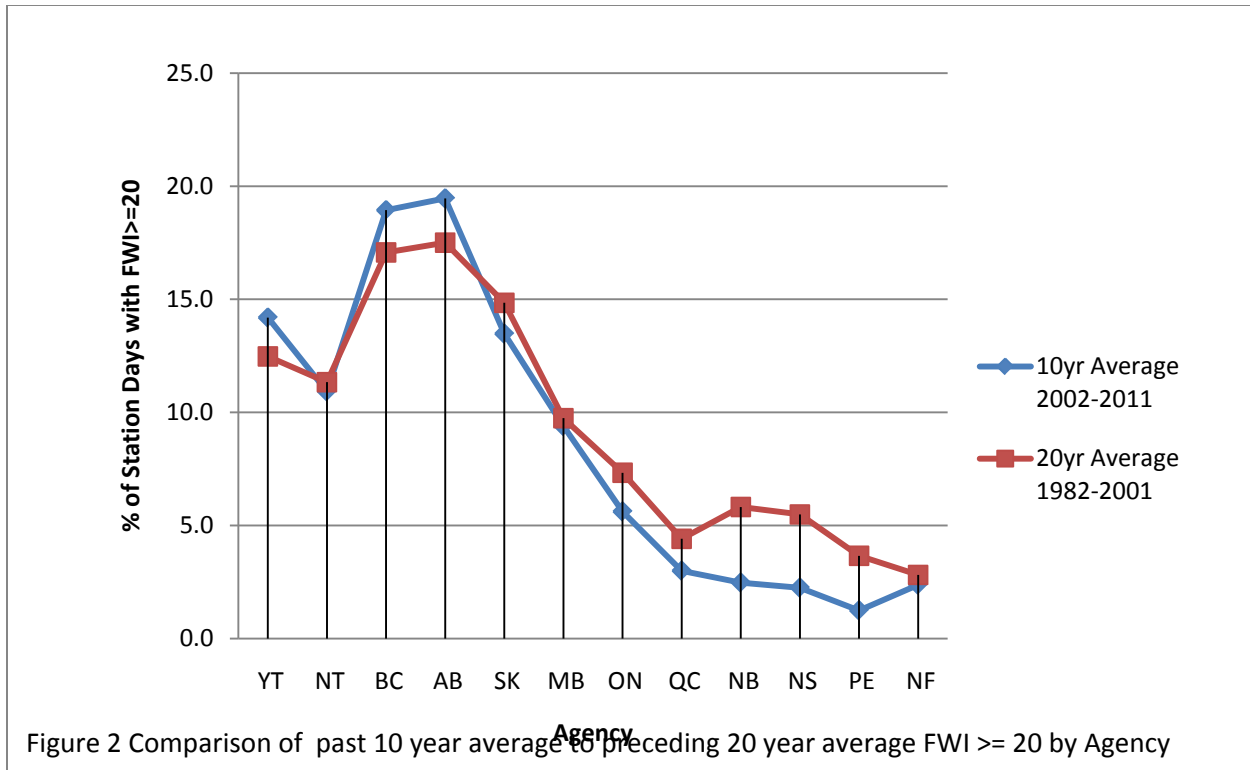
Many agencies identified trends which they related to climate change including:

- More severe weather (rain, lightning, drought)
- More extremes, more wet years, late seasons
- Forecasting of weather patterns seems more difficult
- More storm damaged fuels
- Extension of fire season in northern regions of Canada
- Changes in lightning patterns – earlier? in season, different locations, more fires in some agencies, fewer fires in others, and more multiple fire days related to lightning

Although no data elements specific to climate change were collected, additional analysis of annual number of fires, lightning versus human caused fires and multiple fire days should be completed to investigate this trend.

Other data elements collected that should be analyzed to investigate the **Seasonal Variation** trend are seasonal severity and the percentage of days in high to extreme FWI.

The initial analysis of the FWI data element over 30 years indicates that the west has historically had more high to extreme days per year than the east. And in the past 10 years this trend has increased in the west and decreased in the east (Figure 2).



Trends that could be related to **Fire Intensity** included statements that fires are larger on arrival, are ending up larger, and are taking longer to extinguish. Data has been collected for fires >200 ha for a final size but no data has been collected for reported size or duration of effort which would be required to investigate this trend further.

Larger fires were also tied to increased fuel loading and damaged fuel (insect, storm). Fuel data was not collected as part of this survey but it is being studied as part of another WFMWG project.

Longer fire seasons without increased **Fire Intensity** were noted as a trend. No specific fire intensity data has been collected for this Survey but further analysis of season length and seasonal severity data could be done to investigate this trend.

Overall **Fire Intensity** trends may be indicated but are not clearly discernable in the fire seasonal severity data. This data should have additional analysis.

Many agencies noted that **Fire Response Policy Changes** have or will have an impact on fire load and resource capacity. Policy changes include changes to response zones to increase protection required in former observation or modified response zones in response to increased resource development, species at risk habitat(caribou) or remote communities. In some cases changes may be to reduce protection to increase natural fire impact and reduce protection costs. This will be a future trend to watch for in fire load and resource capacity (area burned, expenditures, etc.).

For agencies which have natural fire or modified response policies in place, further analysis of area

burned could indicate the success of these programs in reintroducing large fire patterns to the landscape for ecological or community safety objectives.

The increasing impact of **Urban Interface** fires was raised as a trend related to increased fire and people interactions at the same time as the amount of fuel loading is increasing. Some agencies are reporting more communities that need to be protected. Fuel data was not collected as part of this survey but is being studied as part of another WFMWG project.

Several agencies reported changes in fire numbers for some causes related to changes to industry (reduced rail and forest industry activity) and recreation activity (fewer people going into the bush). No data was collected on fire causes in this Survey to investigate this trend.

### **Key agency identified trends – Resource Capacity**

Agency trends related generally to **Resource Sharing** suggest that smaller agencies are running out of resources sooner but are more willing to request resources and for the most part are able to get resources because other and larger agencies are not all busy at the same time. Some agencies report that with more multiple fire days occurring they run out of resources sooner. Data has been collected in this survey about resource sharing and multiple fires days that should be analyzed to confirm these trends.

During escalated fire activity and specifically during the shoulder seasons it has been reported that resources haven't been available to meet requirements. The resource sharing data was provided for all resource exchanges that have occurred between CIFFC agencies for the past 30 years but data about lack of resources is not collected. CIFFC reports that 99% of resources orders are filled as requested.

Agencies often check with CIFFC to see what resources are available when they are in need and may only order what they are told is available. No information is available then for unfilled need. To correct this gap, agencies should be encouraged to order what they need rather than what they think they can get. CIFFC's resource ordering process should be modified to collect information about unfilled orders and timeframes to better identify resource shortages.

A trend has been reported by one agency (PC) that the total number of annual personnel export days has remained stable over the past 9 years. However with fewer numbers of staff the number of export days per person has increased and has had an impact on personnel and the organization – e.g., stress on individuals resulting from multiple export assignments, and thus those staff being unavailable for duty in their home positions. This is a trend that could be analyzed for all agencies with the resource sharing data provided by CIFFC.

Trends in **Personnel Availability** were reported by most agencies. Generally the total numbers of Initial Attack fire fighters were noted to be up and down depending on the agency, with a slight overall increase in the past decade, and this is supported by the initial trends in the data (Table 1).

**Table 1: Total of Type 1 Initial Attack Fire Fighters by Agency for 2001, 2006 and 2011**

	<b>2001</b>	<b>2006</b>	<b>2011</b>
<b>BC</b>	330	330	396
<b>AB</b>	220	323	299
<b>NT</b>	38	38	29
<b>SK</b>	255	260	250
<b>MB</b>	162	176	176
<b>ON</b>	751	692	780
<b>QC</b>	203	202	235
<b>NS</b>	8	8	5
<b>NL</b>	0	0	0
<b>Total</b>	1967	2029	2170
<b>Incomplete data below</b>			
<b>NB</b>	nd	nd	20
<b>PC</b>	nd	63	nd
<b>nd=No Data</b>			

The trend for the availability of Sustained Action (Type 1 and T2) fire fighters was reported as decreasing both in numbers and quality and a slight decline in numbers in the latter part of the past decade is supported in the initial trend data (Table 2). No data has been collected about quality of fire fighters. The reasons for this decline included the strong economy in some regions of Canada drawing personnel away from seasonal or short term fire fighter jobs and a change in demographics with the younger generation less attracted to fire fighting.

**Table 2: Total Sustained Action Fire Fighters (Type 1+2) by Agency for 2001, 2006 and 2011**

	<b>2001</b>	<b>2006</b>	<b>2011</b>
<b>BC</b>	440	540	580
<b>AB</b>	1844	1764	1756
<b>SK</b>	307	321	350
<b>ON</b>	600	640	320
<b>QC</b>	703	702	894
<b>NS</b>	117	117	120
<b>NL</b>	177	177	177
<b>Total</b>	4188	4261	4197
<b>Incomplete data below</b>			
<b>NB</b>	nd	nd	40
<b>nd=No Data</b>			

Incident Management Teams and Overhead in general are reported to be declining and this is supported in the initial trend analysis for Type 1 Incident Management Teams (Table 3), although the issue is confounded somewhat by incomplete data. The trend for Overhead is less clear due to missing data.



**Table 3: Total Overhead Personnel and IMT1s by Agency for 2001, 2006, 2011**

	2001		2006		2011	
	O/H	IMT	O/H	IMT	O/H	IMT
<b>BC</b>	300	4	300	4	135	4
<b>NT</b>	59	3	59	3	59	3
<b>SK</b>	150	4	150	3	150	3
<b>MB</b>	122	0	80	0	75	0
<b>QC</b>	86	2	86	2	98	2
<b>NS</b>	30	0	30	0	45	1
<b>Total</b>	747	13	705	12	562	13
<b>Incomplete data below</b>						
<b>AB</b>	nd	8	595	4	583	5
<b>ON</b>	nd	6	nd	6	nd	4
<b>NB</b>	nd	nd	nd	nd	95	0
<b>NL</b>	nd	nd	nd	nd	14	0
<b>PC</b>	nd	4	20	5	0	4
<b>nd=No Data</b>						

Further reductions are anticipated by many agencies from budget restraints. This will be a future trend to monitor.

Changing **Demographics** trends are noted. A significant loss of knowledge and experience is either ongoing or will occur in the near future with a large proportion of fire personnel reaching retirement age. This may already be reflected in the decline in overhead and will be reflected in future trends.

Many agencies are reporting they are developing or need to develop an experience gap analysis to determine the extent of this problem and a plan to rebuild the experience and knowledge base. This will have two conflicting impacts on resource capacity across Canada; more resource orders for experienced overhead staff and fewer staff available to meet the demand.

A change in the demographics of the entry level population is also reported with the following characteristics and issues noted:

- More students available- fewer locals (more turn over-less experience).
- More training required with higher turnovers.
- Students don't have bush sense – more training and safety issues.
- Newer staff does not have the same long term commitment to fire program and move on, which keeps experience levels lower.
- New fitness standards that may exclude older (but experienced) firefighters and replace them with younger (but less experienced) staff..

Some agencies have suggested that the declining experience level may explain the reported trend that fires are getting bigger in areas where resources are stable or increasing.

There was no data collected in this Survey that could be used to analyze this impact on experience and knowledge. Individual agencies could gather their own gap analyses and these could be rolled up into a national summary. This could include anticipated training needs that then could be addressed by individual agencies or on an interagency level through the CIFFC Training Working Group to develop a longer term training plan.

**Air Tanker Fleet** trends are generally noted as adequate with some concern that the total numbers of skimmer aircraft may be declining as agencies sell off older 215s. The data indicates in general that air tanker numbers have been relatively stable, but that older aircraft have been upgraded or are being upgraded with newer, more capable aircraft. Table 4 indicates that heavy skimmer air tanker numbers (primarily CL-215s, 215Ts and 415s) have declined slightly, again mostly as agencies retire older aircraft and upgrade to newer models with more capability. In Quebec the fleet was upgraded but the total number of aircraft has dropped from 23 to 14 over the past 30 years from an original fleet of Cansos and 215s to 215s, 215Ts and 415s.

The absolute decline in skimmer aircraft numbers may raise some concern. Although in general the retired aircraft are being replaced by newer aircraft with more capability (faster, more drop capacity), they are not necessarily being replaced one for one, and a decline in numbers ultimately means that fewer fires could be attacked simultaneously due to the reduction in the actual number of aircraft.

**Table 4: Total Heavy Skimmer Aircraft by Agency for 2001, 2006, and 2011**

	2001	2006	2011
<b>BC( Martin Mars)</b>	2	2	1
<b>AB</b>	6	6	4
<b>NT</b>	8	4	4
<b>SK</b>	6	6	6
<b>MB</b>	7	7	7
<b>ON</b>	9	9	9
<b>QC</b>	14	14	14
<b>NL</b>	6	6	6
<b>Total</b>	58	54	51

Several agencies have noted that older 215s are becoming harder to keep on line and there may be some further reduction to the skimmer fleet due to replacement funding not being available.

**Funding** trends reported ranged from stable to declining with budget constraints expected to continue to challenge agencies ability to maintain resource capacity levels.

Data collected for the survey only specified total suppression expenditures and funding is tied more to pre-suppression costs. In general total suppression expenditures reported are variable.

B.J. Stocks has done analysis on expenditures up to 2009. Other task teams or working groups are working to develop a process to allow agencies to provide this data in a standard format in the future.

There is a need collect more than the total suppression cost only to be able to analyze impacts of changing funding identified by agencies in preliminary trends.

Some agencies reported a trend related to **All Risk response impact on resource availability**. The trend is that resources may be less available to share with other fire agencies because they are tasked to non-fire emergencies. In general many agencies are reporting more response to risks other than fire. However the data provided for this was very limited for historical periods. Many agencies were only able to provide a breakdown of the general types of incidents that they are responsible to respond to or are asked to assist with when the incident occurs.

### **Summary of actual findings and key trends**

In addition to trends and initial data analysis results noted in the preceding agency identified trends, there are additional trends indicated or should be investigated through further analysis in the **data elements** collected. For trends that required simple trend analysis an initial trend was indicated. Recommendations were made for further analysis. Because of the delay in data availability and the need for additional data, further analysis is required for many **data elements**.

### **Key fire load indicators**

Several new **data elements** were collected in this Survey and were created to help define trends related to seasonal variation. These are **Fire Season Severity, Days/season with multiple new starts that needed action, Dates of the first and last fire of the season** and **Number of days in High to Extreme FWI**.

The last two were discussed previously. **Fire Season Severity** provides a qualitative assessment of each season (Low, Medium, High, Extreme). This data looks promising with further analysis for showing national trends on an individual season basis and for changes in regional patterns of severity over a multiple season timeline. Some agencies broke this down between response zones as well to provide trends across the agency.

The **Days/season with multiple new starts that needed action** data element is another that shows promise for identifying trends between agencies seasonally and across longer timelines and should receive additional analysis.

**Evacuations** were not specifically mentioned by agencies as a trend. Data has been difficult to collect.

Two recent papers by J. Beverly et al (2011) suggest two conclusions about evacuation trends:

- Interactions between wildfires and people in Canada (1980-2007) exhibited a unique regional pattern and within the most densely populated regions of the country evacuations can be considered 'low-probability, high-consequence' events.
- The Atlantic Multidecadal Oscillation(AMO) positively correlated with national time series of very large fires(>10,000 ha), wildfire-related evacuations and fire suppression expenditures of the period 1975-2007.

Data has been collected for evacuations (Number of communities evacuated, number of people evacuated, number of person days) and is available for 11-30 years from 8 of 13 agencies. This data is sparse but could be further analyzed.

J. Beverly has provided a suggested set of data elements that could be collected if the intent was to annually collect data to regularly update the results Beverly and Bothwell produced for 1980-2007.

### **Key resource capacity variables**

The **Number of regional compact resources imported** data was gathered for most agencies. Some agencies reported that they only used CIFFC for in-Canada exchanges. The initial indication is that there has been a fairly limited import use of Compact resources over the years. Further analysis of the use of Compact resources should be completed to better understand the role their import has played and could play to supplement Canadian resources. For example the potential numbers and availability of Compact resources outside of Canada that could be available to supplement Canadian resources should be documented to confirm whether this can be a viable alternative to increase resource availability in Canada.

**Other Agreements** data was also surveyed and showed limited use except in Alberta and British Columbia. As in the case of Compact resources additional information about numbers and availability of resources could be collected.

In the Survey a considerable amount of data was collected about the historical availability of resources in Canada and key variables have been discussed in the previous agency trend section. However once the data is complete and consolidated into one database additional trend analysis can be completed.

**Military Use and Availability** data was requested in the Survey and limited use was reported. Canada Command maintains domestic emergency contingency plans (CONPLAN) for various emergencies (Forest Fire, Flood, Hurricanes, Downed Aircraft etc.). Joint Task Forces in each area of the country (for example, Joint Task Force Central is Ontario) maintain a plan for assisting in forest fires (CONPLAN Lynx) and in the plan identifies the various military resources (personnel, aircraft, logistics) it will task if a province or territory declares an emergency and requests assistance through their own Emergency Management organization. All commercial and mutual aid resources should normally be exhausted before the military can assist.

Canada Command could be approached to provide a summary by Joint Task Force of the resources that could be made available. This could be done by each agency or centrally at CIFFC and kept up to date annually. One of the challenges will be that the Canadian Forces are reticent about releasing data about the number of resources they have for security reasons.

**Forest Companies** and **Other Government Services** data was also requested in the Survey and in both cases there was little use reported except in Alberta and New Brunswick for forest industry and New Brunswick was the only agency to report availability for other government services. With the decline in forest industry and reported challenge for most agencies to access other government services these

data elements may not need to continue in future data bases unless agencies anticipate these resources becoming more available in the future.

The Air Tanker Fleet was discussed previously. The **Rotary Wing** fleet data was also collected and in general agencies that own or have long term contracts have upgraded the aircraft size from light and intermediate to medium sized helicopters. Numbers of available aircraft have increased or remained stable and overall appear to have increased (Table 5). To better understand the utility of this fleet it has been suggested that a history of the number of contract days per year could better identify availability trends than just the number of aircraft per year.

**Table 5 Total Owned/Long Term Contract Helicopters by Agency for 2001, 2006 and 2011**

	<b>2001</b>	<b>2006</b>	<b>2011</b>
<b>BC</b>	5	5	9
<b>NT</b>	5	5	5
<b>SK</b>	6	6	7
<b>MB</b>	5	6	6
<b>QC</b>	15	11	11
<b>NS</b>	5	5	6
<b>PC</b>	3	2	4
<b>Total</b>	44	40	48
<b>Incomplete data below</b>			
<b>AB</b>	nd	15	15
<b>ON</b>	nd	13	15
<b>nd=No Data</b>			

Where **Detection Aircraft** are used their numbers have declined. This may indicate a switch from long term contracts to hire as needed to switch funding from pre-suppression to suppression costs but this was not confirmed. **Transport Aircraft** numbers are small and have remained stable or declined.

The use of long term contract **Infrared Aircraft** was only reported by Alberta and has declined for high-level use and increased for low-level use.

**Equipment** (pumps, hose, sprinklers, chainsaws) inventories have been noted as generally stable or increasing although Quebec and Manitoba have reported declines in MKIII pumps (Table 6) and hose.

**Table 6 Inventory of MK3 or equivalent pumps by Agency for 2001, 2006 and 2011**

	<b>2001</b>	<b>2006</b>	<b>2011</b>
<b>AB</b>	652	678	695
<b>SK</b>	621	778	785
<b>MB</b>	731	719	659
<b>QC</b>	1079	878	800
<b>NS</b>	357	357	357
<b>Total</b>	3440	3410	3296
<b>Incomplete data below</b>			
<b>BC</b>	nd	nd	815
<b>NT</b>	nd	230	258
<b>ON</b>	nd	1251	1260
<b>NB</b>	nd	nd	233
<b>NL</b>	nd	295	290
<b>PC</b>	nd	275	275
<b>nd=No Data</b>			

Specialty equipment inventories of **Value Protection Units, Mobile Warehouses, Pump/Hose Trailers, Mobile Command Centres** and **Mobile Fire Camps** have generally remained stable or have increased.

Communication equipment (**Radios, Satellite data kits and phones**, and quick deploy **Weather Stations**) inventories have remained stable or increased except in the Northwest Territories where radio numbers have decreased.

**Structural Apparatus (Engines, Tenders)** inventories have remained stable or increased except in New Brunswick where they have dropped slightly in the past 5 years and are expected to drop further in the coming years.

**Aerial Ignition Kits** inventories have remained stable or have increased.

### **Next Steps**

Agencies have done a good job in a short period of time to put together an initial data set for analyzing trends in fire load and resource capacity across Canada. The next steps with the data collected in this initial Survey are:

- Provide agencies with an additional period of time to gather missing data through the 2012 fire season when they have additional staff available who could be assigned this task.
- Develop a national standard for those data elements that don't currently have a common one to improve the ability to produce national analysis.
- The individual agency datasets gathered for this project and improved over the next season should be gathered into one national dataset for a next round of trend analysis and a national repository of this type of data should be developed for annual data collection and analysis.

Agencies have been successful in identifying a set of trends that they believe have been happening in their agencies and across Canada. Analysis of the data provided has been used to initially investigate these trends but additional data is required as described above and in additional detail in the background documents completed for this project.

Further analysis of the data provided is still required to verify these trends and to further characterize and identify other trends in the fire load data related to:

- Season length
- Seasonal variation
- Seasonal severity

Resource inventory and sharing trends should be further analyzed and summarized at a national level.

The documentation of unfilled resource need is a data gap that should be addressed. Although there is data on resource sharing no data has been collected to describe shortfalls in resources. Agencies should be encouraged to order what they need through CIFFC and CIFFC can document shortfalls on an annual basis. In the future this data can then be used to develop programs to mitigate resource shortages.

The impact of retirement and changing demographics have been noted as a growing trend that is evident in declining Incident Management Team availability and other overhead positions in general.

Additional data is needed from agencies to define the gap in knowledge and experience that can be rolled up into a national summary. This could include anticipated training needs that then could be addressed by individual agencies or on an interagency basis through the CIFFC Training Working Group to develop a longer term training plan.

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