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Research Summary & Report:

Survey on Wildfire Mitigation Techniques Employed by Local Governments in Alberta and British Columbia

Introduction:

Each year, wildfires impact populations and communities across the globe, and put property and infrastructure at risk of damage or destruction. The risk of wildfire to a community is not a static one: as communities experience urban development and expand into previously undeveloped areas, they increase their interaction with the surrounding wildland environment, altering their vulnerability to the risk of wildfire events (Reams et al., 2005). Responsibility for mitigating this risk is shared across a range of players, from the homeowner herself to the local municipality, up to the provincial and federal levels of government.

While several previous studies have focused on the role of the homeowner or landowner in understanding and implementing wildfire mitigation techniques (see for example Nelson et al., 2005; Brenkert-Smith et al., 2006, 2012; Jarrett et al., 2009; McGee et al., 2009), it is important to recognize that local governments have an important role to play as well. Local governments in Canada are responsible for emergency management within their area of jurisdiction, and can be integral in the development and implementation of wildfire mitigation in their communities. This can take many forms, ranging from education and public information campaigns to vegetation management and land-use planning. Despite this, few studies have been conducted on wildfire mitigation by local governments.

In their survey on wildfire reduction programs in the United States, Reams et al. (2005) identified what type of programs were being developed and implemented at the local and state level. They found that the following four types of programs were being implemented: education, assistance to homeowners, area-wide risk assessments, and regulations and standards. Harris et al. (2011), in their study of how local governments in Alberta were implementing wildfire mitigation activities, found that public education

measures were the most popular mitigation activity carried out by participating local governments, and that land-use planning and regulatory measures were rarely used. This finding is similar to that reported by Muller & Schulte (2011) who found that regulatory measures were used infrequently by local government in the United States to mitigate wildfire risks. This study aimed to build on Harris' research by surveying local governments in BC in 2012 to identify how local governments in Alberta and BC are currently mitigating wildfire risks.

Methods:

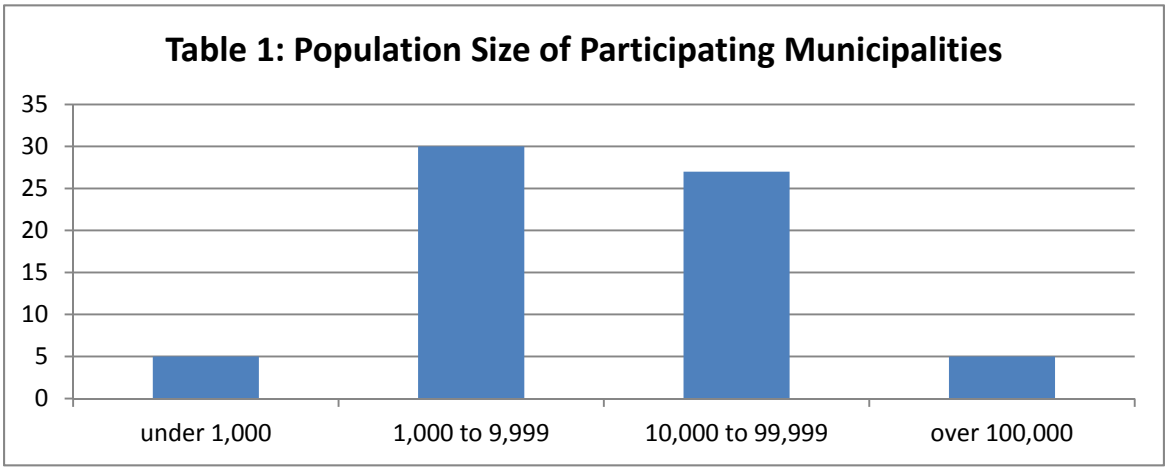
A survey was sent via email to all 373 local governments with fire departments in both provinces and regional districts in BC and counties in Alberta. The survey included 17 questions, 14 of which were multiple choice based (with an option for written notes/clarifications) and 3 of which were open answer based. The survey was sent to the fire chief or chief administrative officer in each municipality. The contact list for Alberta was constructed using the 2012 Municipal Officials Directory (Government of Alberta 2012) as well as contacts listed on the Alberta Fire Chiefs Association website (http://www.afca.ab.ca). The contact list for British Columbia was constructed using the BC Fire Chiefs contact listing (http://fcabc.ca/FDLinks.html), and supplemented through an internet search for municipalities where contact information was not included on the Fire Chiefs contact list.

In total, the survey was emailed to 151 municipalities and/or regional districts in British Columbia and 222 municipalities and/or counties in Alberta. Survey respondents were asked to return the survey through email, fax or mail. This is in keeping with Schonlau et al.'s (2002) finding that having mixed response options available to respondents tends to increase survey response rates. Questions included in the survey asked what type of experience municipalities had had with wildfire, what type of mitigation efforts they encouraged or required their local residents to do, and what type of mitigation measures that the local government itself had implemented. The survey was sent out in a manner similar to the methods described by Dillman (2000) and by Muller & Shulte (2011), firstly by email with the survey attachment on February 28th 2012, with a short reminder email sent out two weeks later. Subsequent to this, a

second sending of the survey email followed a month (March 26, 2012) after the original email, with a final reminder email sent out two weeks later. Once completed surveys were returned (June 25, 2012), data was processed and analysed through the use of descriptive statistics with Microsoft Excel .

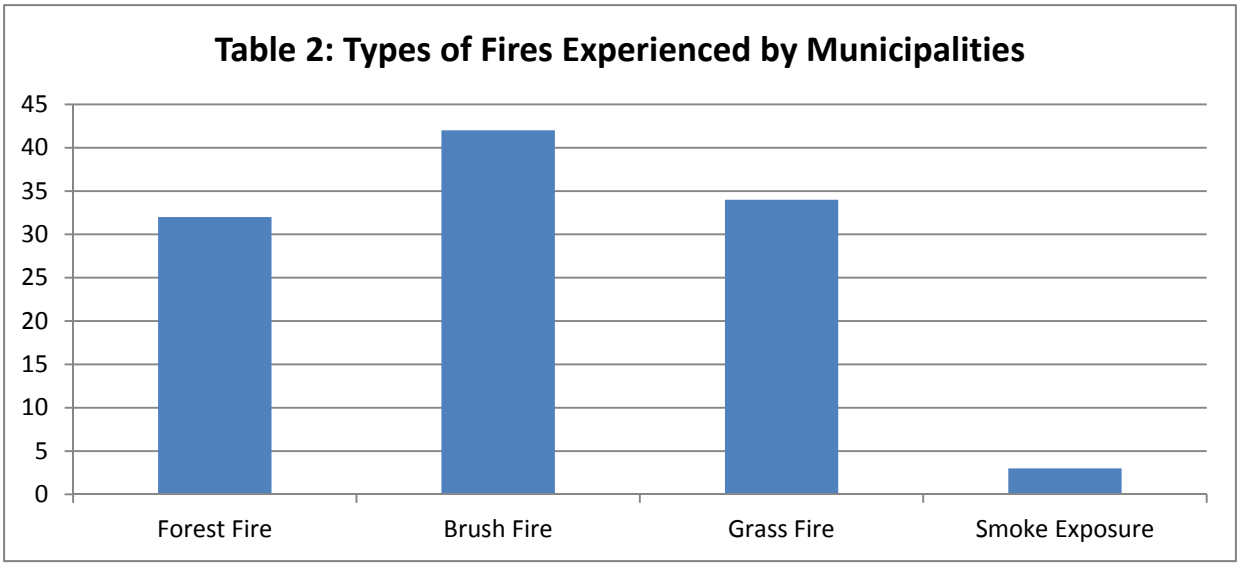
Results:

Of the total 373 local governments who were invited to participate, 65 completed the survey, for a participation rate of 17%. The participating municipalities included 42 from Alberta and 23 from British Columbia. The size of the municipalities, in terms of population, ranged from under 1,000 residents up to over 1 million, with the majority having between 1,000 and 99,000 residents (Table 1).



Most (83%) participating municipalities reported that their local government area had been affected directly by a wildfire (eg. by smoke, evacuation,

structural/infrastructure losses) in the past 20 years.



Local Governments & Mitigation on Private Property

Local governments may encourage residents to implement wildfire mitigation on their property using several different techniques. Most participating municipalities (83%) provided information to residents about wildfire risks and/or measures that they can use to reduce risks on their property. A variety of information dissemination activities were being completed. Some municipalities were setting up FireSmart information booths at community fairs, including seasonal information bulletins in local newsletters, and providing announcements in the local media. Some were cooperating with provincial agencies to host community BBQs in order to raise awareness about wildfire risk. Other efforts to encourage residents to reduce risks on their own property included door-to-door visits by local fire crews to local residents, distribution of information packages to local homes, and the enforcement of local bylaws such as open air fire pit inspections and fire bans. One community developed a FireSmart awards program for its local landowners, which rewarded property owners who made their homes and property "FireSmart" by publicly acknowledging their efforts and awarding them a FireSmart certificate to be displayed on their property.

Sixteen (25%) of the participating municipalities reported completing wildfire hazard assessments on private property. Of the municipalities who replied that they did

not intend to do this, several responded that the onus was on the homeowner to perform their own assessments. Others reported that they would like to this type of service for their community residents but that they could not due to lack of funding and/or available resources.

Respondents from fourteen (22%) participating municipalities indicated that it was mandatory for residents to mitigate wildfire risks on their property. Those municipalities that were not doing this indicated that the level of access needed onto private property to implement this type of mandate was not permitted under local municipal acts. Additionally, some local governments are only able to implement this in new development areas, and some only in new development areas that are deemed to be in wildfire interface areas.

Local Governments & Municipal Mitigation Efforts

Survey respondents in 47 (72%) participating indicated that their local governments had wildfire-specific emergency plans in place. These plans described planned responses to wildfires (including evacuation and communication strategies), as well as identified lead agencies and outlined mutual aid agreements between their municipality and adjacent ones. For those municipalities which did not appear to have a plan that specifically addressed wildfire risk, survey respondents indicated either that their plan used an all-hazards approach or that their municipality had more pressing risks than wildfire (such as earthquakes, flooding, etc.).

Thirty-nine (60%) participating municipalities had a wildfire mitigation/protection plan in place at the time of the survey. Six additional municipalities (9%) planned to prepare a plan in the year following the survey, and a further eight planned to prepare one in the next 5 years. Fourteen municipalities indicated that they did not intend to develop a wildfire mitigation/protection plan for their communities.

Thirty-eight (58%) participating municipalities reported that they were managing vegetation within their areas in order to reduce their wildfire risks. This included activities such as the hiring of seasonal fuel reduction teams, road side vegetation management, removal of pine beetle affected trees, and the creation of fire breaks.

Another method of mitigation employed by 32 (49%) participating municipalities was the use of fire resistant building materials for local buildings and infrastructure. This included the use of materials such as heavy timber, metal clad & steel, brick or stucco, and non-combustible roofing. Several municipalities also mentioned that while using metal did reduce their risk of wildfire, it also had the benefit of being more cost effective since it lasts longer than other materials.

Land use planners in 37 (57%) participating municipalities take wildfire risk into consideration when making land use decisions. This type of mitigation activity included, in one community the establishment of local wildfire zones that influence planning decisions. Within this community, wildfire zones were established in the Official Community Plan, which then influenced what type of developments the community would allow in the high wildfire risk zones. In another case, a municipality required all proposed developments to be reviewed by the Fire Department to determine potential wildfire risk before proceeding with their development plans. Additionally, 27 (42%) also required property developers to incorporate wildfire mitigation into their development plans; this took the form of selection of building materials to reduce wildfire risks, ensuring sufficient access to a water supply, and requiring a professional forester's report before starting development in two communities. However, only 7 participating municipalities (11%) restricted development in any form in high wildfire risk areas.

Twenty-five (38%) survey respondents indicated that their local governments were managing wildfire risks in other ways including: the implementation of residential sprinkler protection systems, the selective clearing of pine beetle affected areas, the use of fire bans during high risk times, and maintaining/fireproofing designated emergency evacuation routes in case of a wildfire. One local government utilized cattle and other grazing animals to reduce fuel loads in the interface areas around their community; this entailed the establishment of community pastures around the town that local farmers were able to graze their animals on, thereby ensuring the reduction of grasses and other fuel materials on the edge of town.

The surveys also provided information about factors that influence the implementation of wildfire mitigation by participating local governments. Importantly, several

municipalities mentioned that a lack of funding and resources left them unable to implement all of the mitigation measures that they would like to implement within their municipalities. Many municipalities (mostly in B.C) reported that the 2011 Slave Lake wildfires did not have a significant impact on their local wildfire mitigation and preparedness efforts. Several municipalities mentioned that while no tangible physical changes came about from the Slave Lake wildfires, there was, however, an increase in local awareness of wildfire risks. A few municipalities, mostly those near to Slave Lake, indicated that the purchase of new equipment used for wildfire mitigation and firefighting was made possible through the high profile nature of the Slave Lake wildfire.

The 2003 Kelowna wildfires and the subsequent Filmon report (Government of British Columbia 2004) were frequently mentioned by survey respondents as having had a significant impact on their local wildfire mitigation and preparedness activities, in both B.C and Alberta. Several programs aimed at funding wildfire mitigation were implemented after the 2003 wildfires, including the Wildfire Fuel Reduction program from the Union of British Columbia Municipalities (UBCM). The inclusion of recommended mitigation and preparedness activities in the Filmon report (such as fuel reduction treatments and the implementation of wildfire specific emergency plans) also influenced what actions local governments took against wildfires. Finally, other wildfires had similar effects on certain municipalities at a local level (ex: 2011 Wood Buffalo fires, 2006 grassfires in Southern Alberta, 2009 Lillooet fire, 2003 Barriere fire).

Conclusion:

Overall, providing information to residents was the most popular way to encourage residents to mitigate wildfire risks. Previous research has also found that information dissemination is a very popular mitigation measure (Reams et al 2005, Harris et al 2011). One quarter of participating local governments were completing wildfire hazard assessments on private properties, and 22% of municipalities were incorporating mandatory wildfire mitigation for residents. When it came to mitigating wildfire risks themselves, just over half of participating local governments were managing vegetation, and just under half were using fire resistant building materials. Interestingly, over half of participating local governments indicated that land use

planners in their local government take wildfire risks into account when making land use decisions, and over 40% require property developers to incorporate wildfire mitigation into their development plans. Seven participating local governments restricted development in high risk areas. Directly experiencing a wildfire seemed to encourage some participating local governments to implement wildfire mitigation. Further study is needed to explore factors that encourage local governments to implement wildfire mitigation activities within their jurisdiction.

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