

# Vegetation Management in Banff National Park: A Survey of Local Residents



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## **Introduction**

Vegetation management activities are undertaken in Banff National Park to restore ecological integrity, when serious negative effects will occur to neighbouring lands outside the park, when facilities, public health or safety are threatened, or when other park management objectives cannot be achieved. Both forest thinning and prescribed fire are used to manage vegetation. To be successful, vegetation management must have a broad base of public support. In particular it requires understanding and collaboration among local citizens and other jurisdictions such as municipalities and provincial natural resource management agencies. This requires both the acceptance of Parks Canada vegetation management activities within the park and the participation of near-by communities and residents in wildfire mitigation measures (e.g., FireSmart® activities).

National Park and nearby residents' perceptions of the risk from prescribed fire and wildfire, their acceptance of vegetation management strategies within national parks, and their preferences for residential wildfire mitigation measures were first studied in collaboration with the University of Alberta during 2006 using personal interviews. That study was used to identify salient aspects of wildfire and vegetation management among a small sample of key residents in the area. This second component of the study examines the prevalence of these views among the broader resident population.

During the period of February to May 2008 the Canadian Forest Service, in collaboration with the University of Alberta and Parks Canada, conducted a survey of people living in or near Banff National Park. This report presents results pertaining to views of vegetation management strategies in Banff National Park, perceived risk of fire, personal experiences with fire, knowledge of wildfire, and views on Parks Canada's communication with local residents.

## **Methods**

A commercial marketing company was hired to recruit residents of Banff, Lake Louise, Canmore, Harvie Heights, Exshaw, Deadmans Flats, and Lac-des-Arch. Residents were contacted by telephone and asked if they would be willing to complete a questionnaire sent to them by mail.

A total of 1712 surveys were mailed, with 1204 completed and returned. After adjusting for invalid addresses, this gives a response rate of 74.2%. Respondents who indicated they worked for Parks Canada (n = 67) were excluded from the analysis. The results have a margin of error of  $\pm 2.7\%$ , 19 times out of 20.

## Results

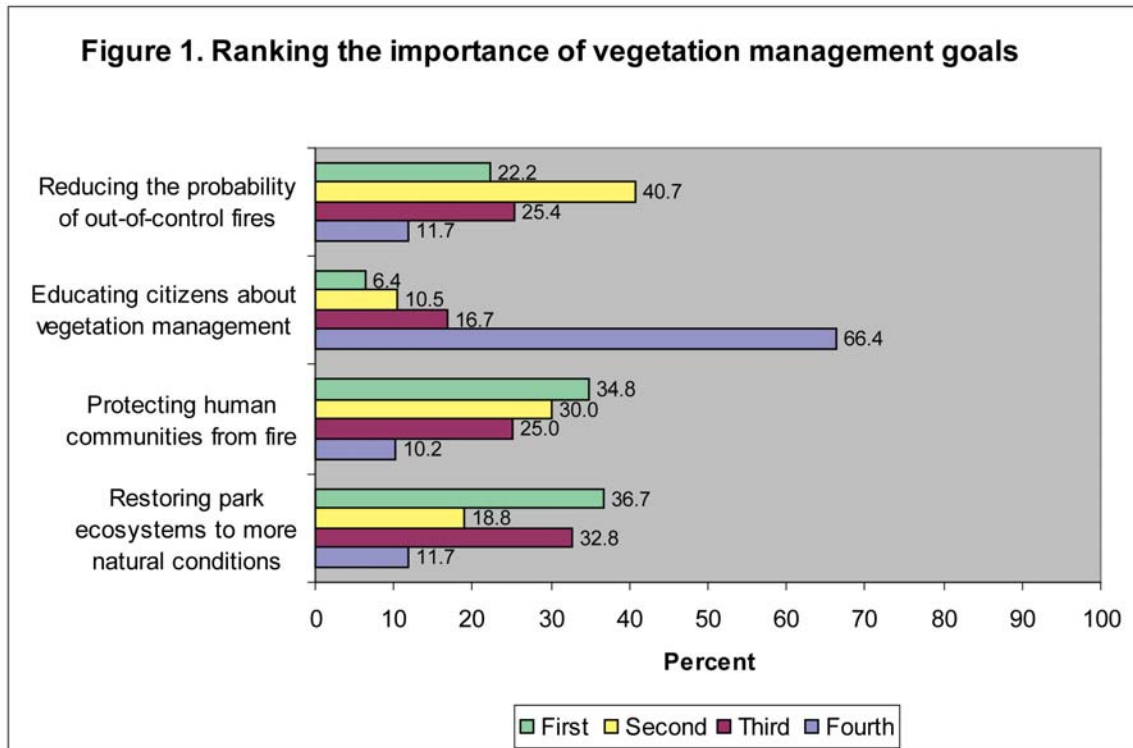
The demographics of the respondents were compared to Statistics Canada 2006 census information for the sampled areas. Respondents reflected the population's breakdown for gender, age distribution, and education levels.

Respondents residing within Banff National Park were compared with respondents residing outside the park on all variables in this report. There were very few questions for which respondents living within the park had statistically different responses to those living outside of the park. As such, all responses were pooled and points of difference are noted where they occur.

### Vegetation management strategy

Respondents were asked their level of satisfaction with vegetation management in Banff National Park using a 5 point scale where 1=very dissatisfied and 5=very satisfied. The average response was 3.5, indicating slight satisfaction.

The vegetation management strategy has a number of goals, four of which were presented in the survey. Respondents ranked them from most (1) to least (4) important. Results are shown in Figure 1.



*About an equal number chose protecting communities and restoring ecosystems as the most important vegetation management goal (ranked as 1). Reducing the probability of out-of-control fires received a strong second ranking*

(41%). Respondents clearly considered educating citizens as the least important goal (66% ranked it as 4).

Respondents were also asked to rate their level of awareness of Banff National Park’s vegetation management strategy. Results are shown in Table 1.

Table 1. Awareness of vegetation management strategy

|                    | Number | Percent |
|--------------------|--------|---------|
| Not aware of it    | 71     | 6.4     |
| Little knowledge   | 460    | 41.1    |
| Moderate knowledge | 488    | 43.6    |
| Well informed      | 99     | 8.8     |

*Most indicated that they had little (41%) to moderate (44%) knowledge of the park’s vegetation management strategy. On the other hand, very few were either not aware of it, or felt that they were well informed.*

### **Views on vegetation management**

The survey contained descriptions of vegetation management, forest thinning, and prescribed fire based on information available from Parks Canada website. Respondents were asked what best described their views on the use of thinning and prescribed fire within the park. Table 2 shows the number and percentage of people choosing each of the responses.

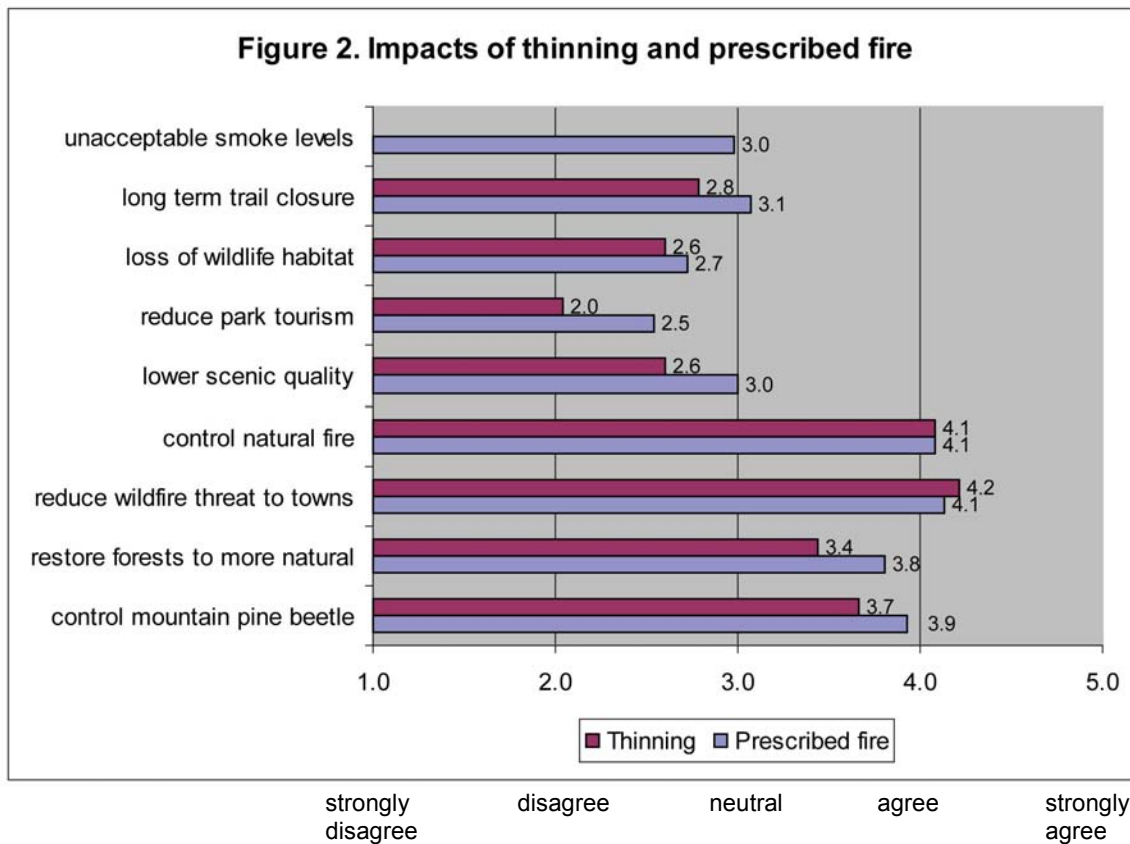
Table 2. Views on the use of thinning and prescribed fire

|   | Thinning |         | Prescribed fire |         |
|---|----------|---------|-----------------|---------|
|   | Number   | Percent | Number          | Percent |
| Should be used wherever it is necessary                               | 655      | 59.8    | 541             | 49.3    |
| Should be done only infrequently, in carefully selected areas         | 405      | 37.0    | 482             | 43.9    |
| Should not be considered because it creates too many negative impacts | 14       | 1.3     | 51              | 4.6     |
| Is an unnecessary practice  | 21       | 1.9     | 23              | 2.1     |

*Respondents believed that both prescribed fire and thinning are good vegetation management strategies, but had a preference for thinning, and a greater desire to see care taken in the use of prescribed fire. Respondents seem*

to be willing to grant more latitude in the use of thinning (60% felt it should be used wherever it is needed) than prescribed fire. There was less support for using prescribed fire wherever it is needed (49%) and more support for using it infrequently in carefully selected areas (44%). Less than 5% of respondents felt that thinning or prescribed fire should not be considered or viewed it as unnecessary.

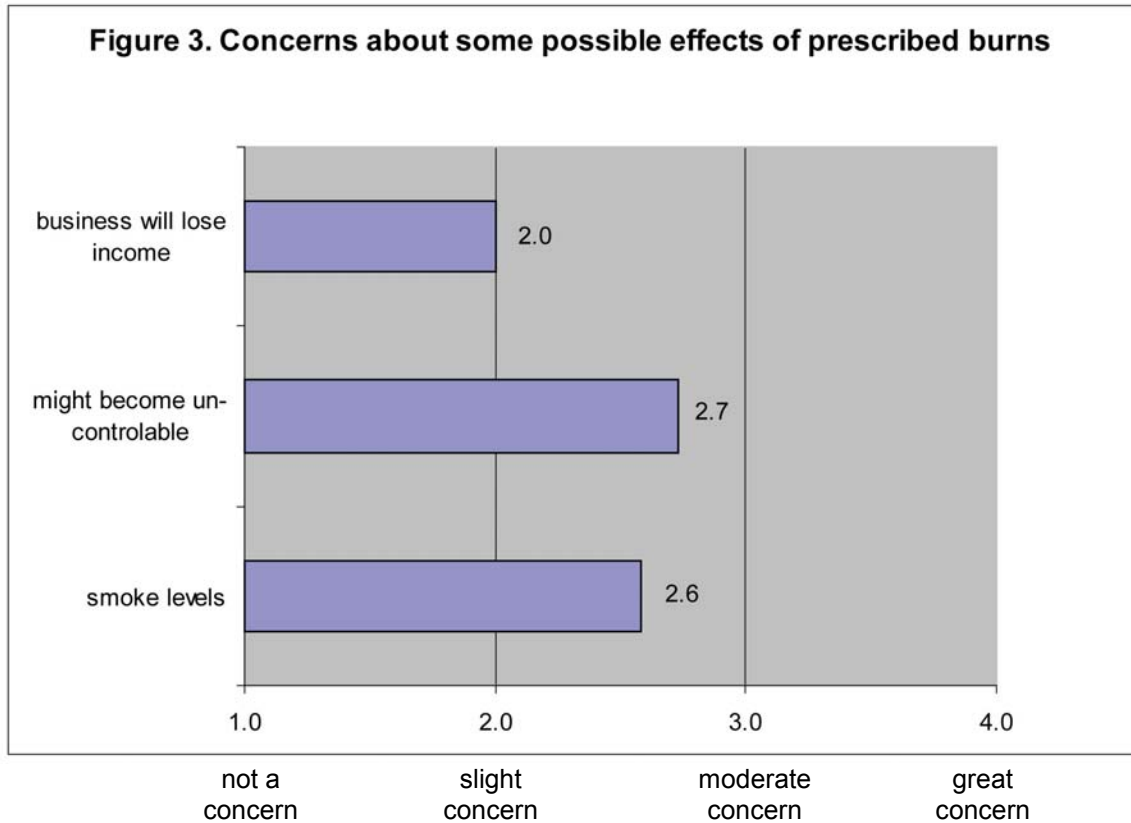
Respondents indicated the extent to which thinning and prescribed fire will contribute to several potential impacts. Figure 2 presents a shortened version of the statements that were rated and the average response for each.



Respondents agreed that both strategies contributed to controlling wildfire and mountain pine beetle, restoring forests to natural conditions, and reducing fire risk to towns. Both strategies were rated equally in reducing risk (controlling natural fire and reducing threats to towns) but prescribed fire was rated as having more positive ecological impacts (restoring forests and controlling mountain pine beetle). Respondents disagreed that either thinning or prescribed fire reduces tourism or contributes to loss of wildlife habitat. Prescribed fire was rated as having about neutral impacts ( $M = 3.0$ ) on trail closures, park scenery, and levels of smoke. However, thinning was viewed as having less effect on long term trail closures, reducing tourism, and lowering scenic quality than prescribed fire.

### Prescribed fire

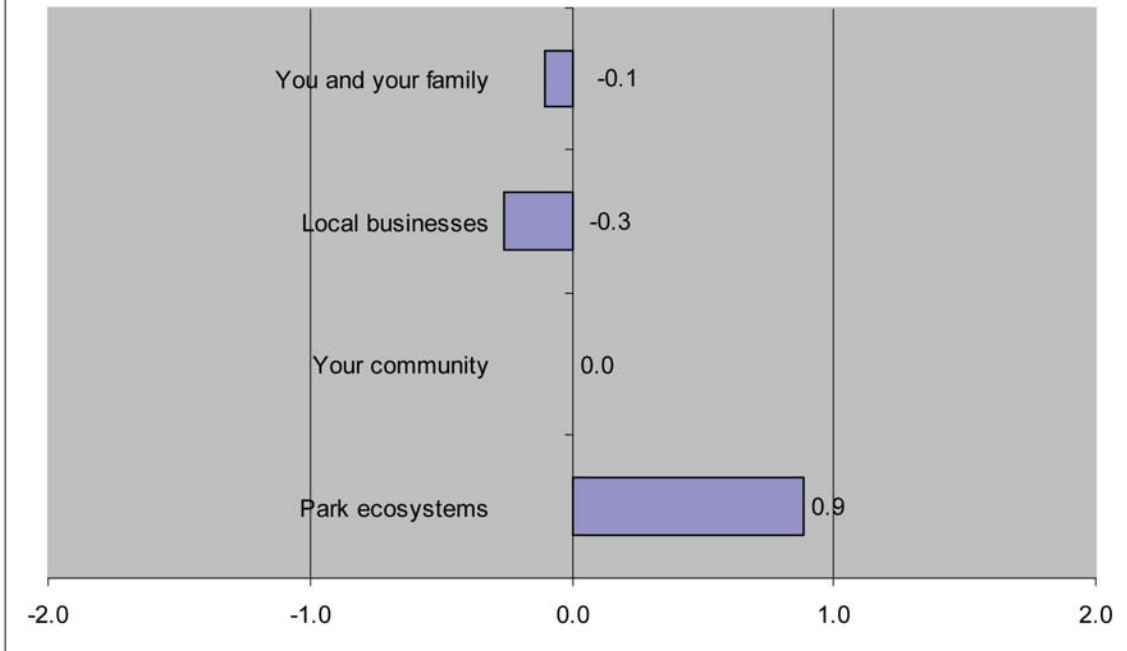
Respondents were asked about possible concerns related to prescribed fire within the park. The concerns presented were smoke levels, the possibility of fire escape, and the effect on local business. Concerns were rated on a 1 to 4 scale where 1=not a concern and 4=great concern. Figure 3 shows the average values of the responses.



*Respondents showed a slight concern about business losses, and slight to moderate concern over the levels of smoke and that a prescribed fire might burn out of control. Residents of Banff National Park expressed greater concern (M = 2.1) over the loss of local business than the other respondents (M = 1.8).*

Views on the kinds of impacts (positive or negative), and acceptability of impacts of prescribed fire on park ecosystems, community, local businesses, and the respondent and their family were solicited. The averages of the responses are shown in Figures 4a and 4b.

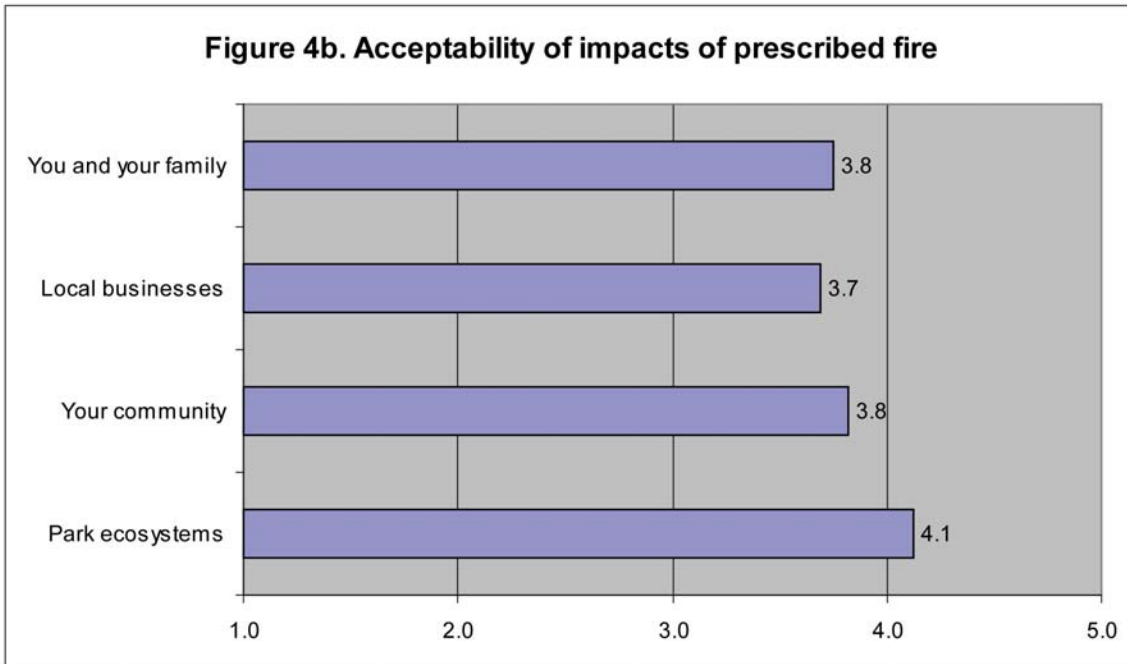
**Figure 4a. Impact of prescribed fire**



very negative impact      negative impact      no impact      positive impact      very positive impact

*Respondents felt that the only positive impact of prescribed fire was on park ecosystems. Impact on local businesses and self (you and your family) were rated as only slightly negative. Prescribed fire was rated as having no impacts on the community.*

**Figure 4b. Acceptability of impacts of prescribed fire**

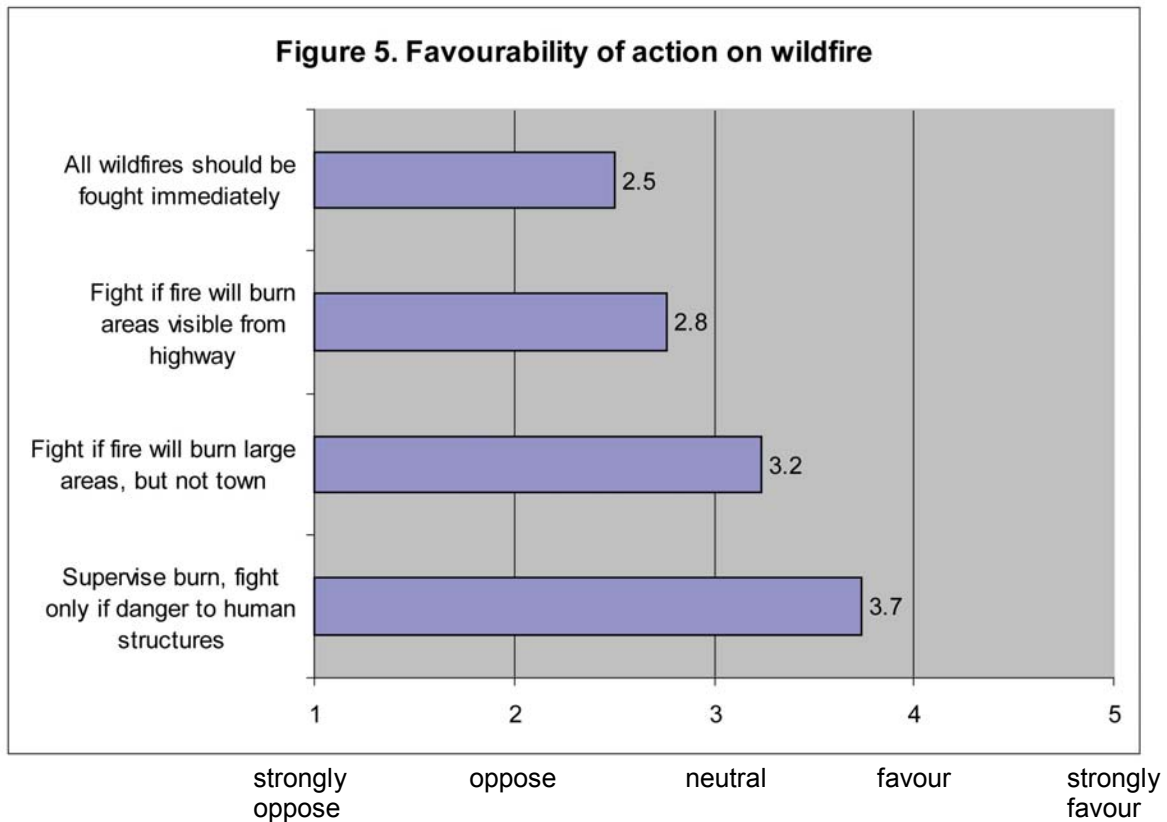


not at all acceptable      somewhat not acceptable      neutral      somewhat acceptable      completely acceptable

*Although respondents indicated there were negative impacts to local business and their community, they rated these impacts as somewhat acceptable. The impact on ecosystems was rated the most acceptable.*

### **Wildfire in Banff National Park**

To obtain respondents' views about how wildfire should be treated in the park we first defined wildfire as "any forest fire, grass fire or brush fire that is caused by nature (lightning). It does not include prescribed fire or fires caused by human carelessness (such as unattended campfires)." The actions that the park should take in the case of wildfire were investigated by rating four options on a five point scale where 1=strongly oppose and 5=strongly favour. Figure 5 shows the average responses.



*Respondents were somewhat opposed to immediately fighting all wildfires (halfway between oppose and neutral). They were slightly opposed to fighting fires that are visible from highways but not a threat to communities or facilities, and slightly in favour of fighting fires that burn large remote areas but are not a threat to communities or facilities. The option that received the highest level of support was allowing a wildfire to burn under supervision and fought only if it seems likely it will threaten communities or facilities.*



## Experience with fire

The extent to which respondents had experienced fire (wildfire or prescribed fire) was examined in two questions. The first presented several types of experiences as shown in Table 3. The second asked whether respondents had visited a forest within 5 years of it being burned and the reason for the visit (see Table 4).

Table 3. Type of fire experience

|  | Percent with experience |
|--|-------------------------|
| I have read about or watched coverage of fires in the media (i.e. television, newspaper) | 99.3                    |
| I have felt fear or anxiety because of a fire  | 46.7                    |
| I have experienced discomfort or health problems from smoke                              | 47.6                    |
| Fire has come close to my community  | 53.4                    |
| I have been placed on evacuation alert   | 8.7                     |
| I have been evacuated  | 2.0                     |
| I have seen smoke or flames near my house  | 33.9                    |
| I have lost my house or other structures on my property                                  | 1.0                     |
| I have experienced a loss of income or business  | 6.0                     |
| I have experience or training in fire management or as a firefighter                     | 12.9                    |

*Nearly all respondents had seen coverage of fires in the media. About half had experienced fear or anxiety, discomfort from smoke, or had fire close to their community. Very few had been evacuated, or experienced personal loss from fire. More residents of Banff National Park reported experiencing fire close to their community (65.4%), being on evacuation alert (11.5%) and experiencing a loss of income (8.3%) than residents from outside the park (47.5%, 7.3% and 4.7%, respectively).*

Table 4. Reasons for visiting burned sites

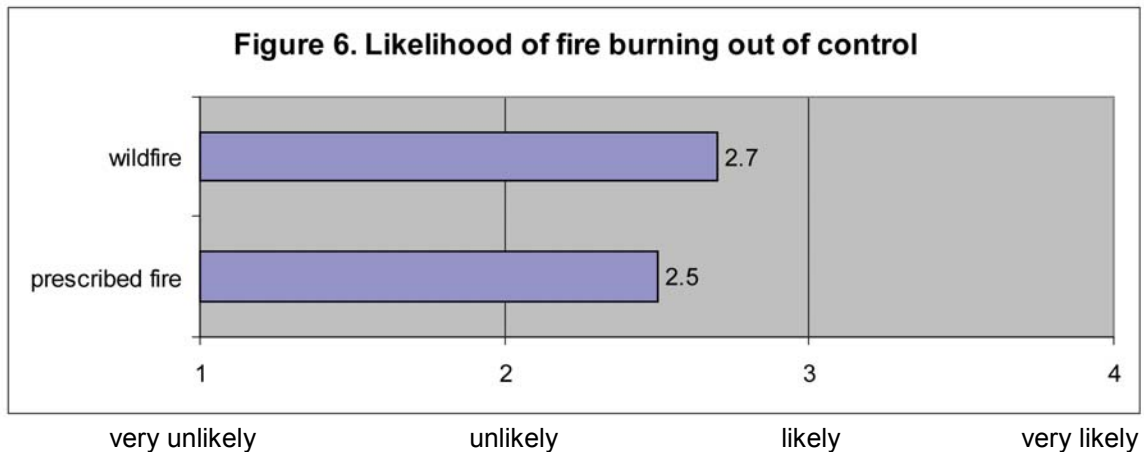
|  | Number | Percent |
|--|--------|---------|
| To see the damage caused by the fire   | 599    | 62.2    |
| To see wildflowers or other vegetation | 629    | 65.3    |
| To look for wildlife                   | 299    | 31.0    |
| To learn about fire                    | 261    | 27.1    |
| To conduct research or work            | 41     | 0.4     |
| Because the fire improved the view     | 100    | 10.4    |

*A majority (80%) had visited a forest that had been burned in the previous five years. Of those who visited a burned forest, about 2/3 indicated they visited to see the damage or to see wildflowers. More Banff Park residents reported visiting burned sites to see wildflowers or vegetation, to look for wildlife, and to learn about fire than non-park residents.*

*About 1/3 of visitors to burned areas also indicated they visited for other reasons. About 10 to 15% of these visitors indicated that their visit was limited to passing through burned areas by motor vehicle, hiking, or skiing. In other words, fire was not the main reason for their visit to the area.*

**Perceived risk of fire**

Respondents were asked for their views on the likelihood that either a prescribed fire or a wildfire will burn out of control in the park during the next five years. We used a 4 point rating scale where 1 = very unlikely and 4 = very likely. Figure 6 shows the average responses.



Respondents viewed wildfire as posing a slightly greater risk of burning out of control than a prescribed fire. The sample was divided on the potential of a prescribed fire burning out of control, with the average response between unlikely (2) and likely (3). Residents of Banff National Park perceived a slightly greater risk ( $M = 2.6$ ) that a prescribed fire will burn out of control than respondents from outside the park ( $M = 2.4$ ).

### Knowledge of Wildfire

Respondents were asked to answer a set of true or false statements to obtain a basic understanding of their knowledge of wildfire. The responses are shown in Table 5.

Table 5. Knowledge of wildfire

|  | Correct response | Mostly true | Mostly false | Not sure |
|--|------------------|-------------|--------------|----------|
| Fires burn faster going up hill  | True             | 55.4        | 5.6          | 39.0     |
| Houses only burn when the flames from a fire reach the house                               | False            | 11.4        | 73.3         | 15.3     |
| Fires can be an important force in controlling outbreaks of disease and insects in forests | True             | 90.0        | 3.0          | 7.0      |
| It takes decades before plants grow in a fire damaged forest                               | False            | 6.0         | 89.5         | 4.5      |
| Fires usually result in the death of most large animals in a burnt area                    | False            | 5.7         | 76.3         | 18.0     |
| Fires help recycle minerals and nutrients needed by trees and other plants                 | True             | 88.1        | 2.9          | 9.0      |
| The majority of all fires in Banff National Park are caused by lightning                   | False            | 43.0        | 17.6         | 39.4     |

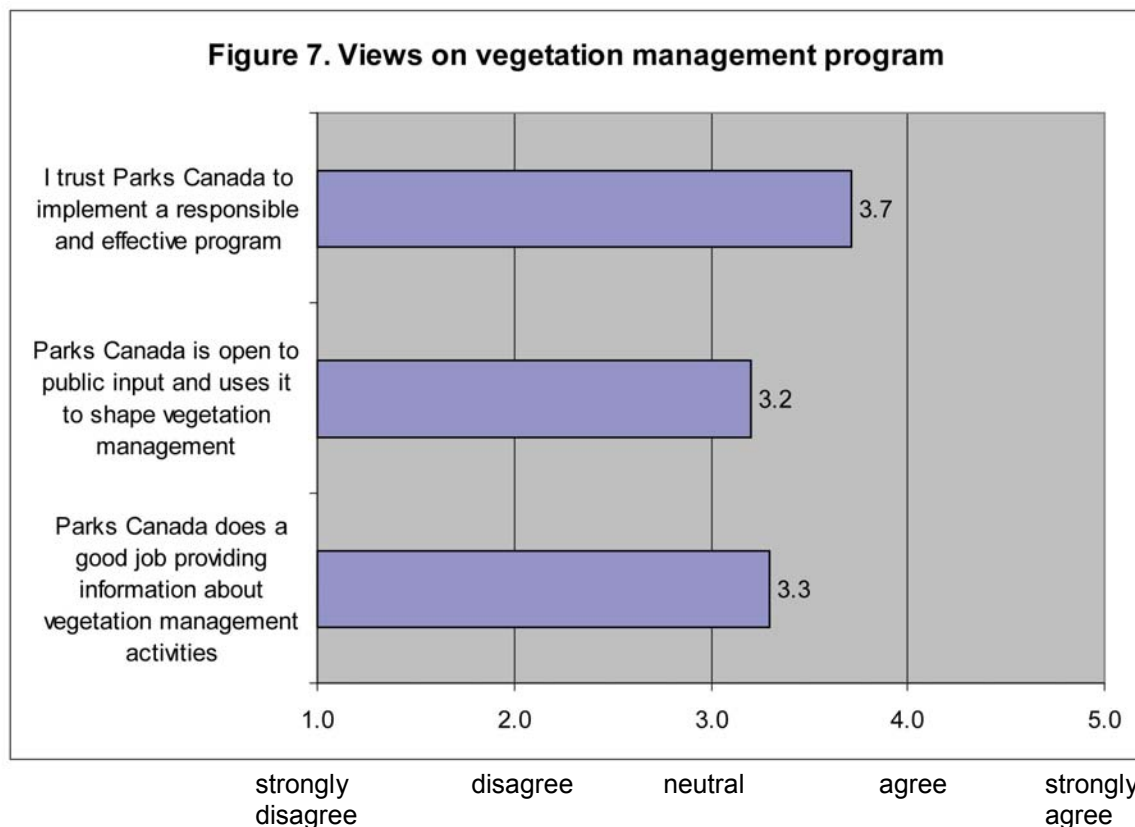
Respondents were quite knowledgeable about wildfire. They were very knowledgeable about basic fire ecology with about 90% answering the three fire ecology related questions correctly. They were less knowledgeable about fire behaviour with slightly more than half knowing that fires burn faster going uphill and about 75% knowing that fires do not usually kill most large animals and 55%

knowing that houses do not only burn when the flames from a fire reach the house.

Respondents from outside of Banff National Park showed a slightly higher level of knowledge than residents of the park. More non-park residents correctly answered the statements that fires are important in controlling disease and insect outbreaks (91.9% non-park; 86.3% park), that it takes decades for plants to grow (91.5% non-park; 85.4% park), that fires result in the deaths of most large animals (77.4% non-park; 74.4% park), and that fires help recycle minerals and nutrients (89.9% non-park; 85.0% park).

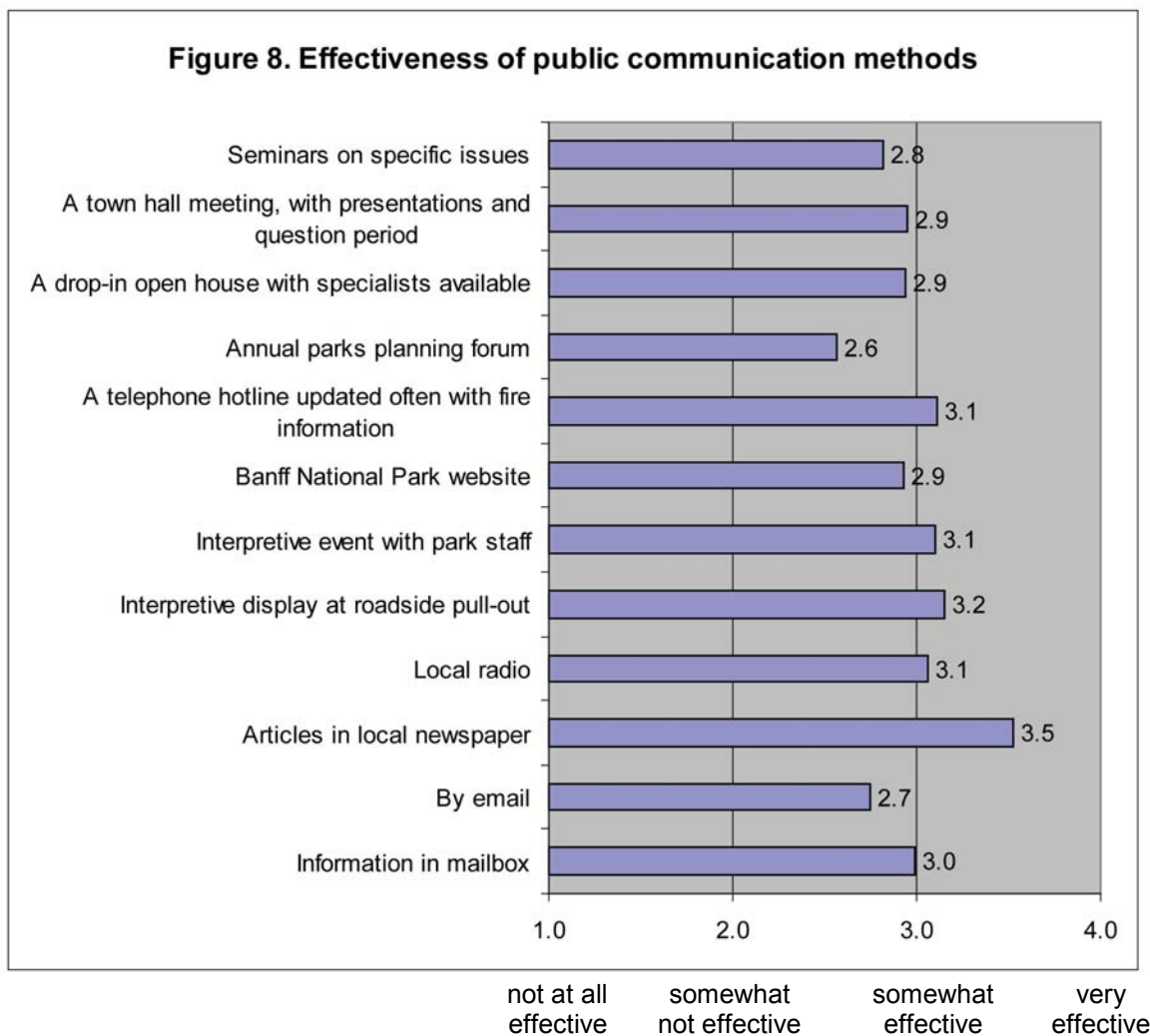
### Communication with residents

Respondents were asked their views about public input and communications related to vegetation management. The first question asked for agreement or disagreement with three statements related to public input. A second question asked about the effectiveness of various means of communicating with the public. The average responses to these questions are shown in Figures 7 and 8.



*Although there appears to be a moderate level of trust that Parks Canada will implement a responsible and effective vegetation management program, respondents agreed only slightly that Parks Canada is open to input and is doing a good job at providing information.*

**Figure 8. Effectiveness of public communication methods**



*The most effective means of communication is the local newspaper. E-mail and the annual parks planning forum were rated as the least effective methods. The majority of the options including local radio, open houses, telephone hotlines, the parks' website and interpretive events and displays were rated just above or just below "somewhat effective." However, none of the communication methods were rated as ineffective ( $M \leq 2.0$ ).*

## Conclusions

This study has provided some insights into local residents' views of vegetation management in Banff National Park. It builds upon results from a previous study that used an interview approach to define aspects of vegetation management that were of interest to residents. This study used a survey approach to examine the views of a more representative sample of the local population. The following represent some key findings.

- Restoring park ecosystems and protecting human communities were considered the most important goals of vegetation management. In terms of the means to achieve these goals, over 90% of respondents supported the use of both thinning and prescribed burns. More latitude was granted to the use of thinning with support being quite strong for thinning wherever it is necessary. Although there is also support for using prescribed fire wherever necessary, not surprisingly, a more cautious approach is advocated, with more residents supporting the use of prescribed fire infrequently, in carefully selected areas.
- Thinning was viewed as being only slightly less effective than prescribed fire at achieving ecological objectives. However, thinning was viewed as equally effective in achieving human protection goals and less damaging to human use aspects of the park (tourism and scenic quality).
- There is clearly support for fire in the park. For example, few residents supported complete suppression of lightning-caused fire and were supportive of allowing these fires to burn under supervision as long as they did not threaten communities or facilities. Prescribed fire was viewed as positive for park ecosystems, and only slightly negative for local business and self and as having no impacts on the community. Importantly, all of these impacts were rated as acceptable. This support occurred in spite of about half of respondents reporting feelings of fear or anxiety because of a fire, having fire come close to their community, and experiencing discomfort or health problems from smoke.
- Although there was not a high level of satisfaction with vegetation management, and not strong agreement that Parks Canada is open to public input or that Parks Canada does a good job at providing information about vegetation management, residents trust Parks Canada to implement a responsible vegetation management program. This apparent paradox could be due to a high level of trust in the individuals involved in vegetation management. Fire management expertise and trust of individuals were cited as important factors in supporting vegetation management during the personal interviews conducted in 2006. Trust might also arise from what respondents witness as they visit burned sites

and travel the park. Although they might not know the details of the vegetation management program, they can appreciate the results.

- About half of respondents indicated that they have little or no knowledge of the vegetation management strategy but they appear to be quite knowledgeable about basic fire ecology and most have considerable experience with fire. There are topics, however, that appear not to be well understood. Respondents' knowledge of differences between the ecological outcomes of thinning and fire, fire behaviour, and the causes of fires in the park could be improved. However, simply providing information to the public will not necessarily build trust or increase acceptance of vegetation management.
- In terms of communicating with residents, several communication methods appear to be effective in reaching the public but the local newspaper seems to be the most effective. Local newspapers were also cited by interviewees in the 2006 study as the primary source for information. Other studies, however, suggest that methods that involve interaction between a management agency and the public (such as field tours) are more effective in developing understanding and trust.

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This report is also available from the following website:

<http://research.eas.ualberta.ca/hdhresearch>

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