



# **MOUNTAIN PINE BEETLES AND COLORADO FORESTS**

**Kremmling Community Re-Survey Report**

## Introduction

This report describes changes in community reactions to the mountain pine beetle (*Dendroctonus ponderosae*) outbreak and resulting changes in north central Colorado forests. In 2006, a project was initiated to assess community responses to forest disturbance by mountain pine beetles. The full study included nine communities: Breckenridge, Frisco, Dillon, Granby, Kremmling, Silverthorne, Steamboat Springs, Vail, and Walden. This report focuses on responses from the community of Kremmling.

In 2007, 4,027 survey questionnaires were mailed to randomly selected households with addresses in the study communities. 1,346 completed surveys were returned (127 surveys received from Kremmling), yielding an aggregate response rate of

38.9%, accounting for undeliverable surveys. Findings from the 2007 survey provided baseline information regarding community residents' risk perceptions, public relationships with land managers, environmental attitudes about forest management, and local action capacities in the context of forest disturbances caused by bark beetles.

A re-study mail survey was sent in 2018 to those original respondents from the 2007 survey and an additional sample of 3,000 households randomly selected from a database from USADATA. In 2018, 128 of the 1,130 completed surveys were received from Kremmling. Findings from the 2018 survey were compared to 2007 survey results to assess how attitudes and actions within Kremmling have changed over time.

## Perceptions of Beetle Impacts

Respondents were asked to indicate perceptions of forest mortality, natural regeneration, and beetle impacts. As in 2007, survey respondents rated the level of tree mortality they observed in and around Kremmling on a scale from 1 (no pines are dead) to 5 (all pines are dead). Similarly, respondents were asked to indicate the extent of regeneration they perceived in and around Kremmling on a scale from 1

(no natural re-growth) to 5 (much natural re-growth). Perceptions of tree mortality and natural regeneration are depicted in Figures 1 and 2. In 2018, survey respondents in the Kremmling area indicated perceiving higher degrees of tree mortality (mean response 3.7 compared to 3.5 in 2007), but also perceived more natural regeneration (mean response 2.8 compared to 2.2 in 2007).

Figure 1: Perceptions of Tree Mortality

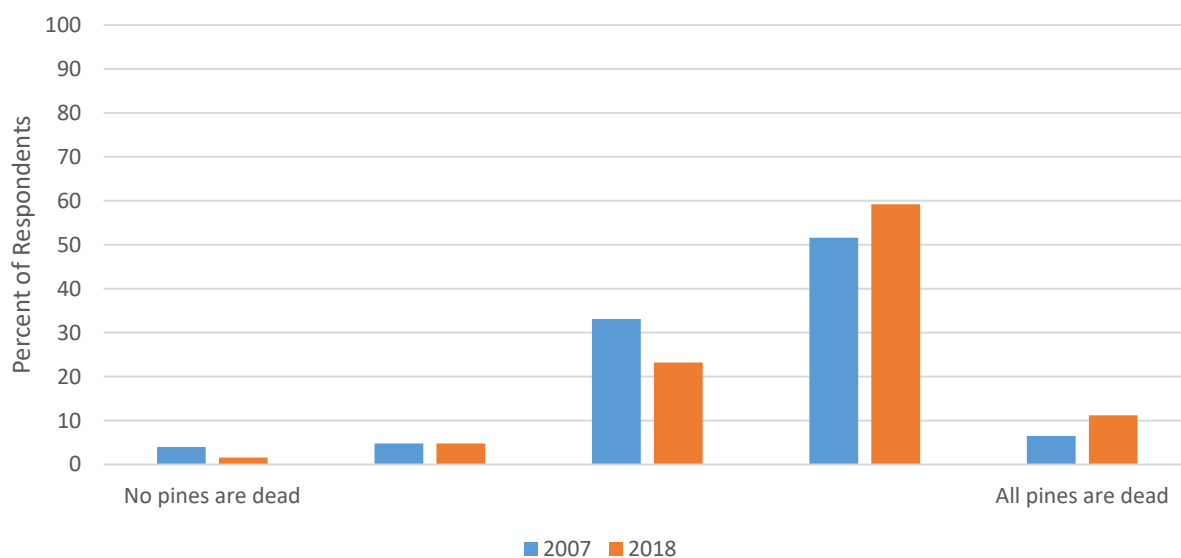
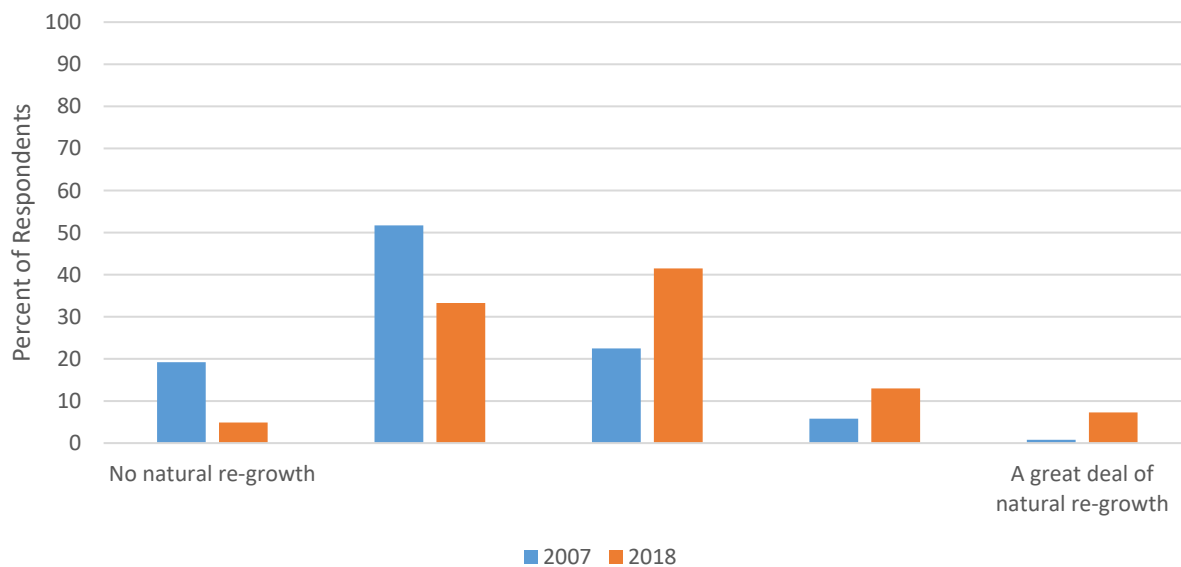


Figure 2: Perceptions of Natural Regeneration



In both years, Kremmling respondents were asked to rate the impacts from the mountain pine beetles on a graduated scale from 1 (very negative) to 5 (very positive). The bars in Figure 3 indicate the percent of respondents who indicated observing each mountain pine beetle impact in and around their community. Respondents indicated lower level of impact regarding most issues compared to 2007. The most frequently indicated observations for 2018 respondents were “falling trees”, “visual/aesthetic loss”, and “fire hazard”. The least frequently indicated impacts in 2018 were “impact on tourism”, “loss of privacy”, and “affected property values”.

The bars in Figure 4 indicate the mean values for each impact according to the

answers of respondents, arranged left to right from most positively perceived impacts to most negatively perceived impacts. Only “availability of firewood” was indicated as a positive impact of mountain pine beetles (having a mean greater than 3.5). Survey respondents also had slightly more positive views in 2018 regarding many impacts such as “forest rejuvenation”, “affected property values”, “loss of privacy”, “emotions such as grief or sadness”, and “fire hazard”, as compared to the 2007 survey. Notably, respondents had more negative views regarding “availability of firewood”, “ecological awareness”, “logging and land clearing”, “expanded timber industry”, “job creation”, and “trail and forest accessibility”.

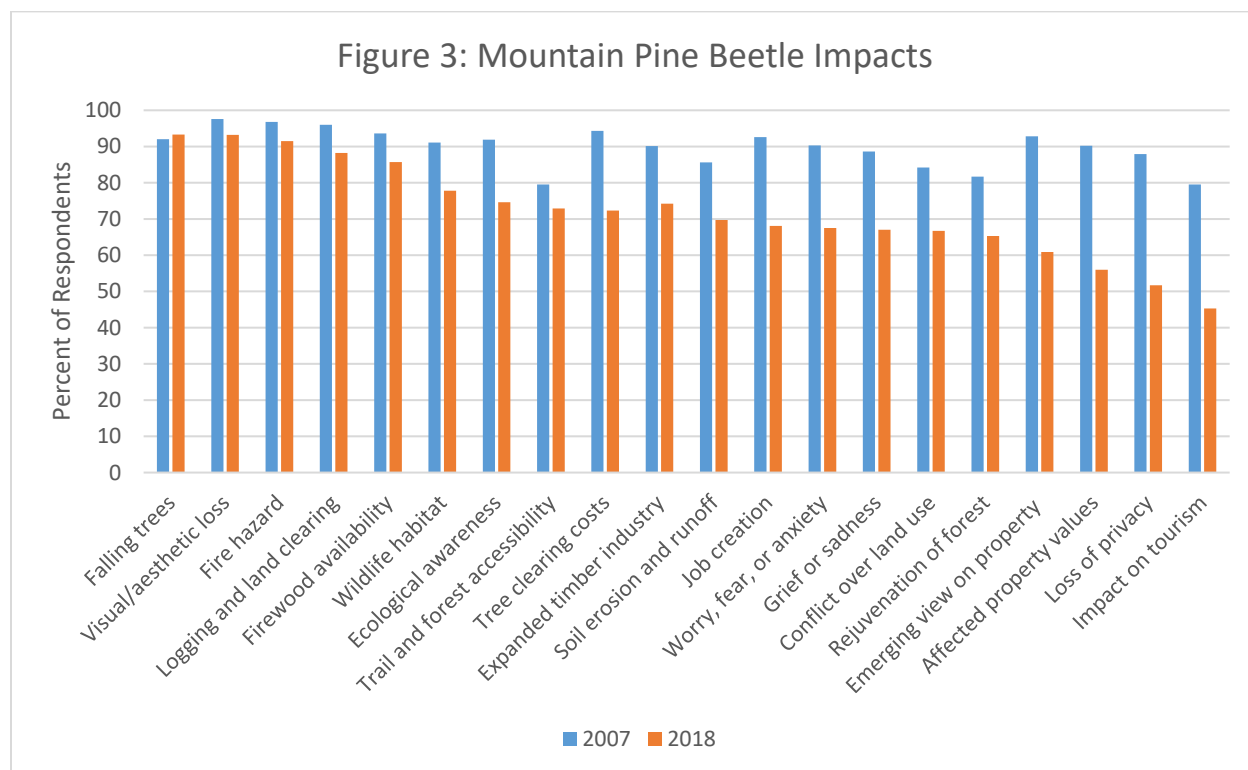
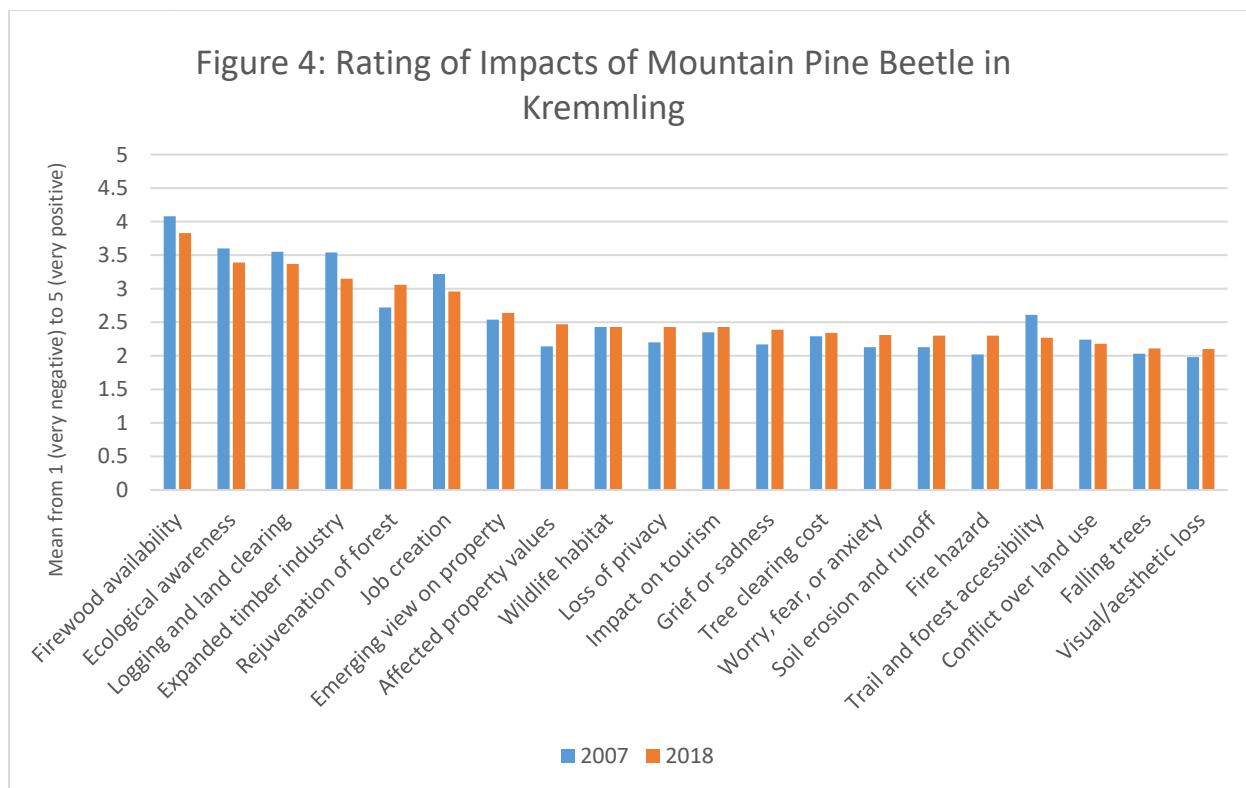


Figure 4: Rating of Impacts of Mountain Pine Beetle in Kremmling



## Forest Risk Perceptions

Forest risk perceptions were measured with a scale from 1 (not concerned) to 5 (extremely concerned). The bars in Figure 5 indicate the mean values for each concern according to the answers of respondents, arranged left to right from highest levels of concern to lowest levels of concern. While levels of concern for 2018 respondents remained generally elevated, respondents expressed less concern about most issues as compared to 2007. Higher levels of concern

were indicated by 2018 respondents for “falling trees”, and there was a slightly increased level of concern for “impact to livestock grazing” as compared to the 2007 survey. In 2018, the highest rated concerns were “forest fire”, “falling trees”, and “loss of scenic/aesthetic quality”. The lowest rated concerns for the area were “loss of community identity”, “loss of tourism and recreation opportunities”, and “impact on livestock grazing”.

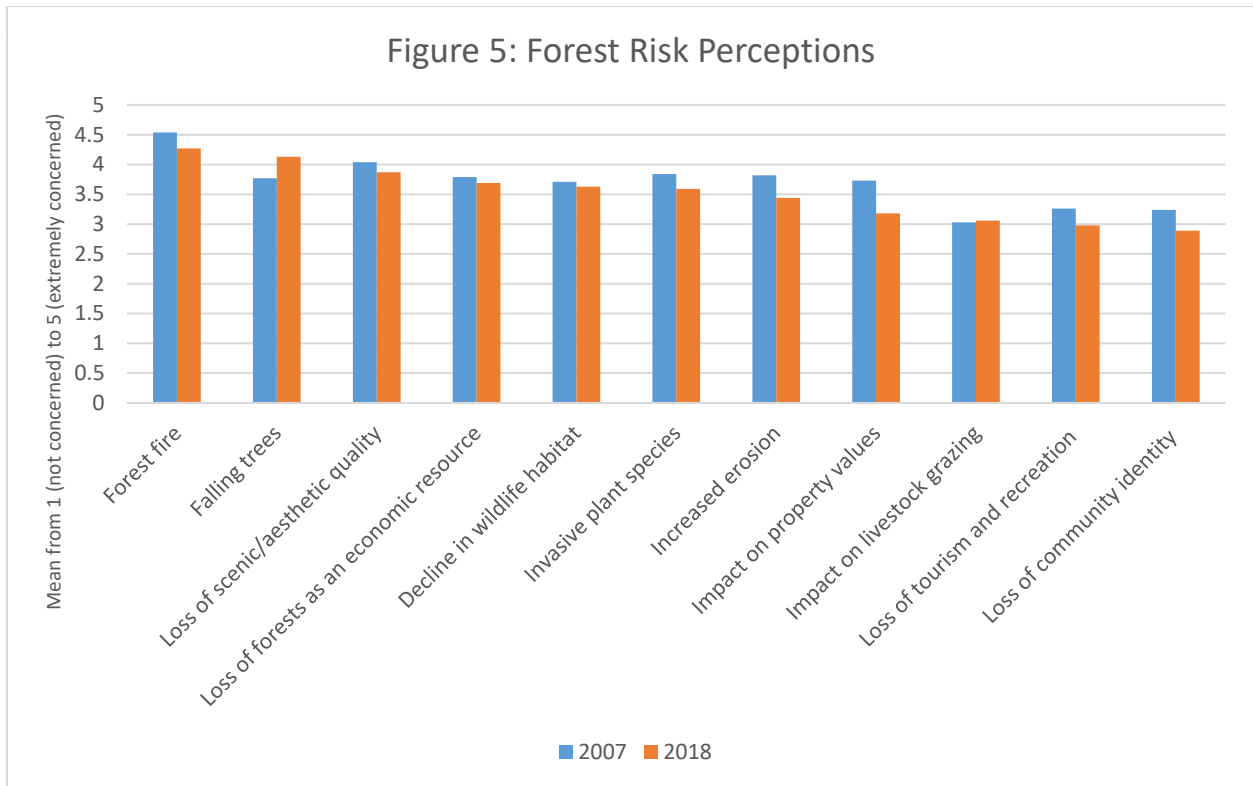
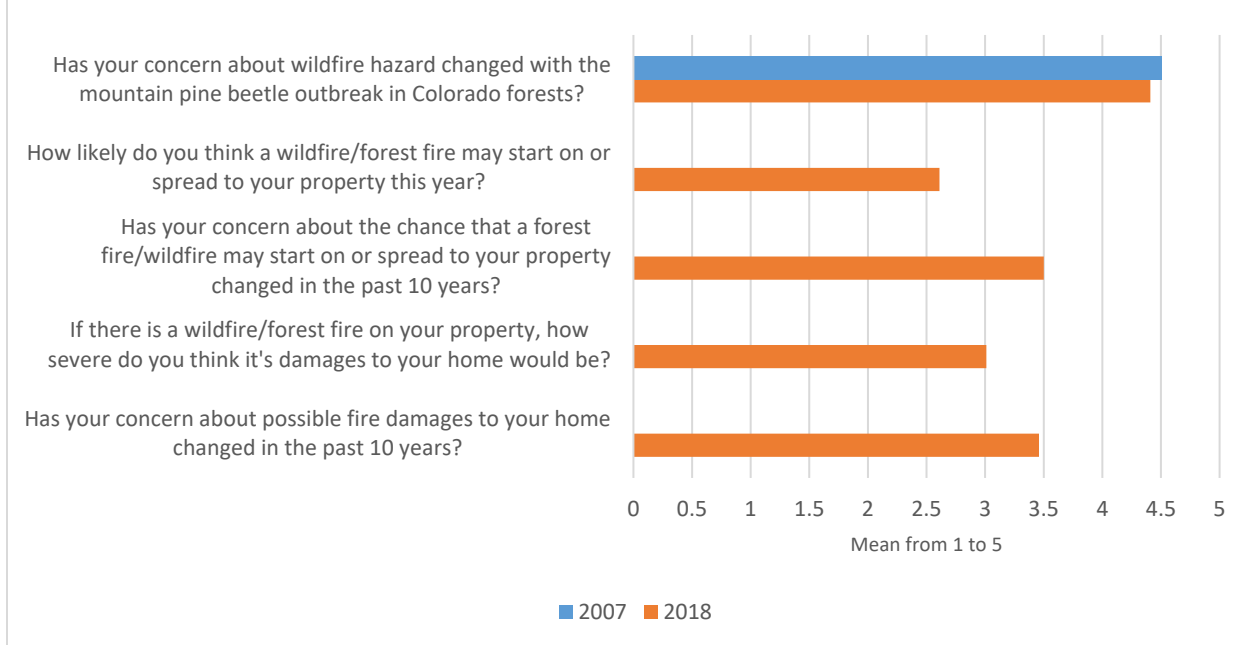


Figure 6 shows perceptions of wildfire risk. For the questions “has your concern about wildfire hazard changed with the mountain pine beetle outbreak in Colorado forests,” “has your concern about the chance that a wildfire/forest fire may start on or spread to your property changed during the past 10 years,” and “has your concern about possible fire damages to your home changed during the past 10 years,” perceptions were measured on a scale from 1 (strongly decreased) to 5 (strongly increased). For the question “how likely do you think a wildfire/forest fire may start on or spread to your property this year,” perceptions were measured on a scale from 1 (not likely) to 5 (very likely). For the question “if there is a wildfire/forest fire on your property, how severe do you think its

damages to your home would be,” perceptions were measured on a scale from 1 (not at all severe) to 5 (very severe).

The only question to appear in both survey years was “has your concern about wildfire hazard changed with the mountain pine beetle outbreak in Colorado forests?” Similar to 2007, 2018 respondents indicated an elevated level of concern regarding wildfire risks with the mountain pine beetle outbreak (means of 4.5 and 4.4, respectively). In the 2018 survey, the respondents also indicated elevated levels of concern (mean of 3.5) over the past 10 years regarding the chance that a forest fire/wildfire may start or spread to their property and the perceived possibility of fire damages to their home.

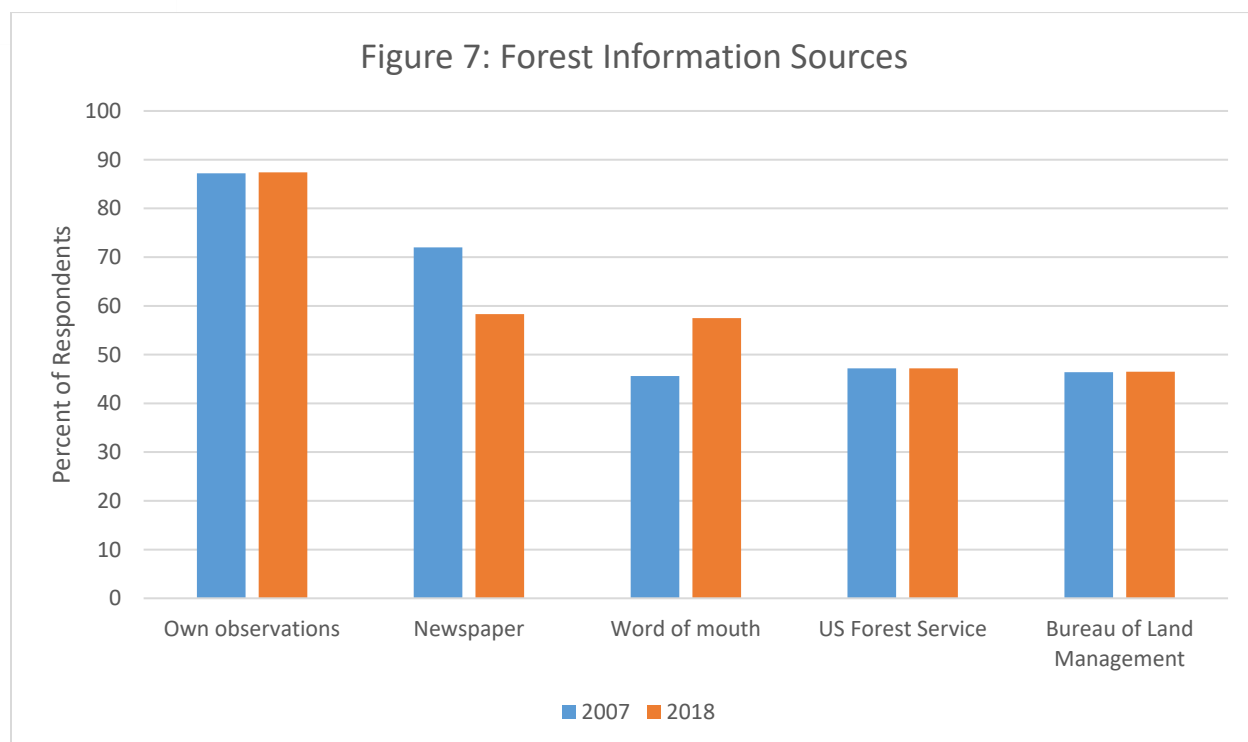
Figure 6: Perceptions of Wildfire Risk



## Sources of Forest Information

Respondents were asked to indicate which sources of information they relied on regarding forest issues. The percentages of respondents indicating reliance on the top five sources are displayed in Figure 7. The most popular sources of forest information for respondents in the area included “own observations”, “newspapers” and “word of mouth”. In the 2018 survey, respondents in

the Kremmling area reported a decreased reliance on “newspapers” and an increased reliance on “word of mouth”, as compared to the 2007 survey. Respondents’ sources of forest information including “own observations”, “US Forest Service”, and “Bureau of Land Management” were relied upon in similar levels for both 2007 and 2018.

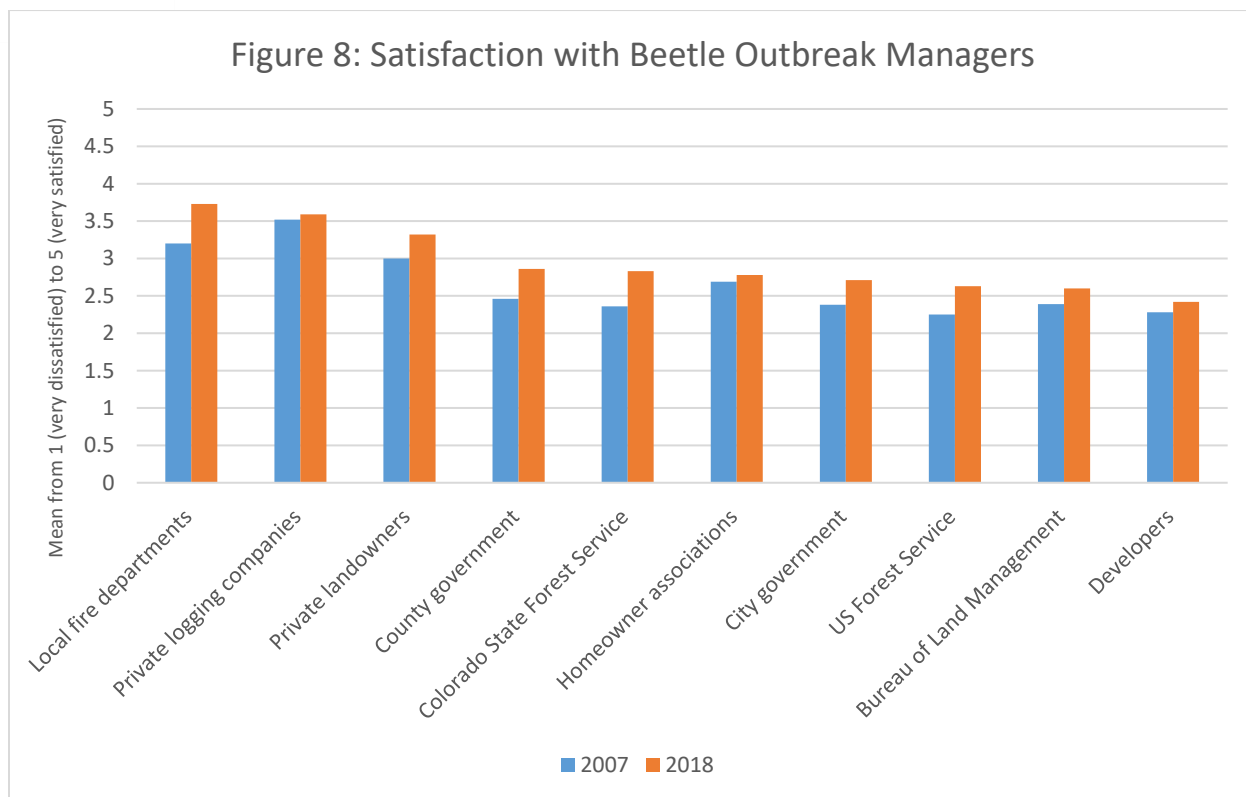


## Satisfaction with Management

In both 2007 and 2018, respondents were asked to indicate their level of satisfaction with entities involved with the management of the pine beetle issue on a scale from 1 (very dissatisfied) to 5 (very satisfied). The mean ratings for each entity are displayed in Figure 8. Similar to 2007, respondents indicated satisfaction (mean at or above 3.5) with “private logging companies” in the 2018 survey. Notably, in 2018, Kremmling

area respondents also indicated an increased level of satisfaction with “local fire departments” (mean above 3.5), as compared to 2007 respondents. Moderately or slightly increased levels of satisfaction (or less dissatisfied) were also indicated for all other land management entities, particularly “local fire departments”, “county government”, and “Colorado State Forest Service”.

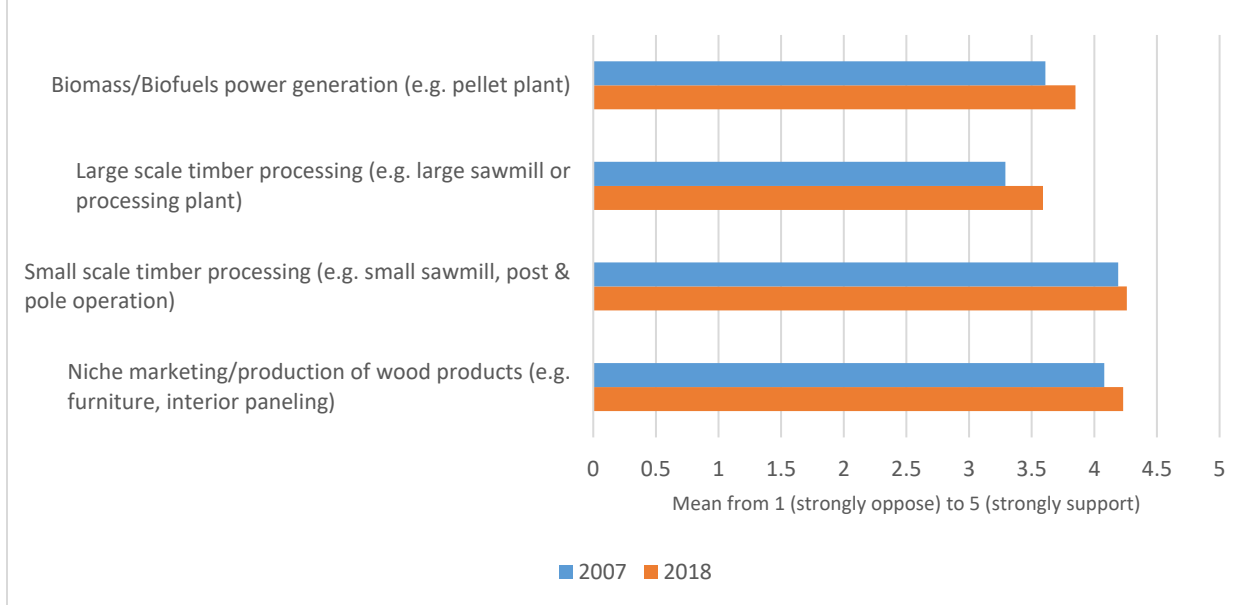




Respondents were also asked to indicate their level of support for several industry options in or near Kremmling, including “biomass/biofuels power generation (e.g., pellet plant),” “large scale timber processing (e.g. large sawmill or processing plant),” “small scale timber processing (e.g. small sawmill, post & pole operation),” and “niche marketing/production of wood products (e.g. furniture, wood paneling)”. Respondents indicated their support on a scale from 1 (strongly oppose) to 5 (strongly support). Mean values for each option are displayed in Figure 9. Similar to 2007, the 2018 respondents were, on average,

supportive of all industry options (means above 3.5), with “small scale timber processing” and “niche marketing/production of wood products” indicated as the most favored industry options. In 2018, respondents indicated higher levels of support for all industry options compared to 2007. “Small scale timber processing” was the most supported option for respondents in 2007 and 2018. However, “niche marketing/production of wood products” was indicated as equally supported as “small scale timber processing” by the 2018 respondents.

Figure 9: Support for Forest Industry

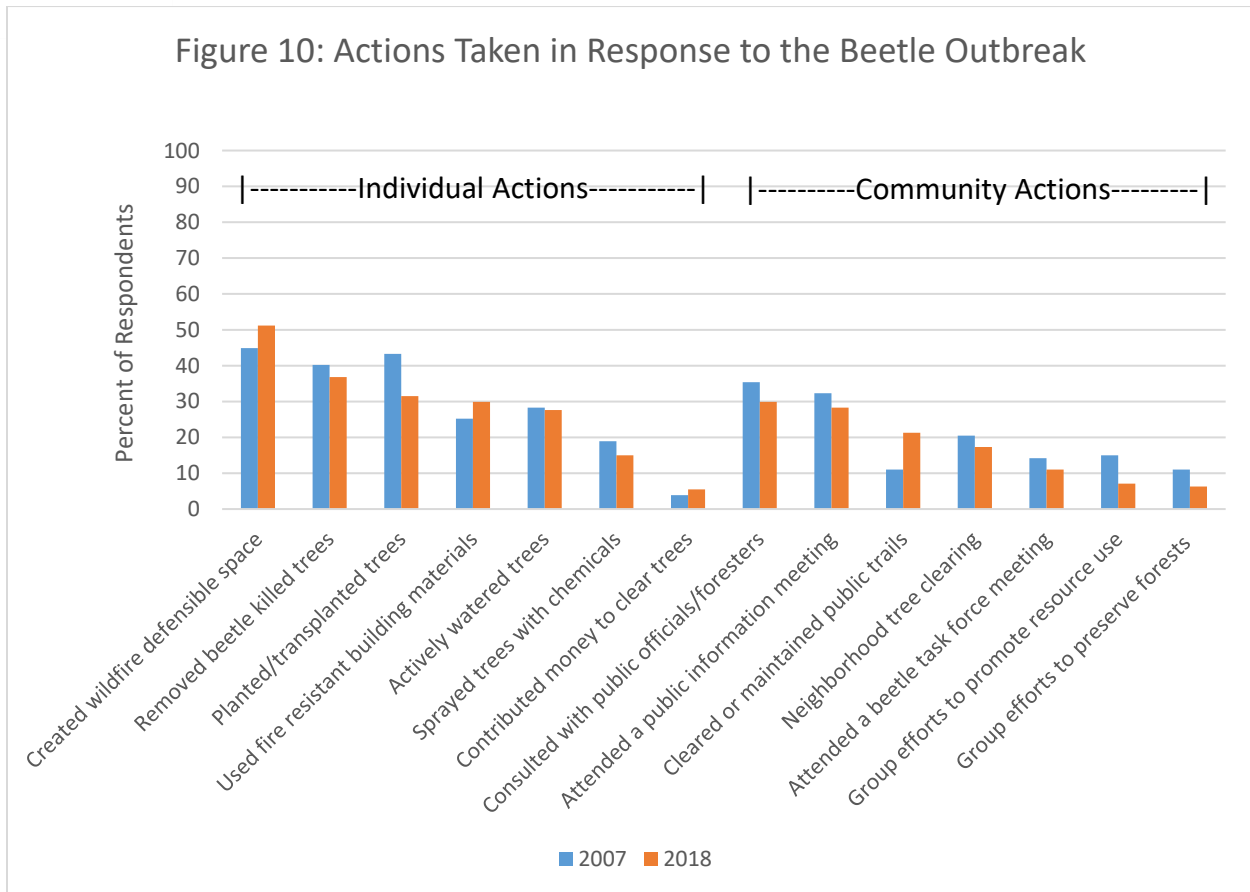


## Response to the Beetle Outbreak

Respondents were asked to indicate if they had participated in a series of actions in response to the mountain pine beetle. Figure 10 shows the percent of all respondents who undertook various activities, both as individuals and as part of community efforts. In both the 2007 and 2018 surveys, the proportion of respondents indicating participation in individual/household activities (on the left side) were higher than the proportion of those indicating participation in community related activities (on the right side). For individual actions, creating wildfire defensible space near structures, removing beetle killed trees, and

planting/transplanting trees were the most actively reported activities for respondents in both 2007 and 2018. Notably, in 2018, higher levels of creating wildfire defensible space, using fire resistant building materials, and contributing money to Homeowner Association efforts to clear trees were indicated by respondents, while lower levels of other individual actions were reported, as compared to the 2007 survey. Regarding community responses, the resurvey respondents reported lower levels of participation in all community actions with the exception of increased levels of participation in public trail clearing or maintenance activities compared to 2007.

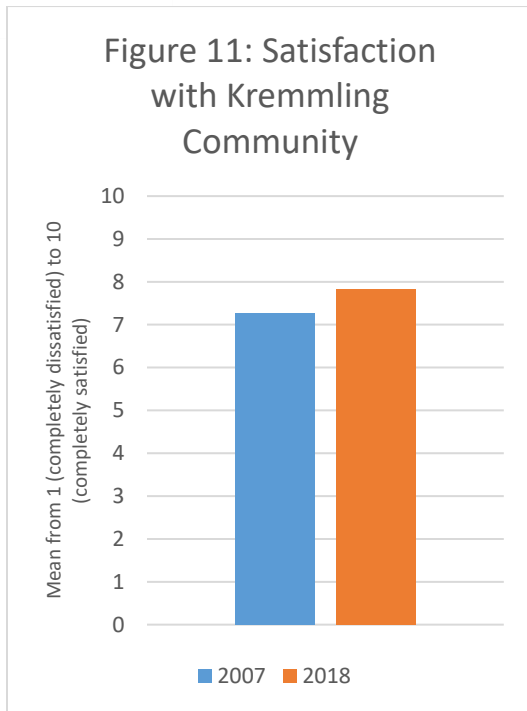
Figure 10: Actions Taken in Response to the Beetle Outbreak



## Community Experience and Participation

Both surveys also contained questions related to respondents' community experience and participation in Kremmling. Respondents were asked to indicate their level of satisfaction with Kremmling as a place to live on a scale from 1 (completely

dissatisfied) to 10 (completely satisfied). Mean responses for both years are indicated in Figure 11. In both 2007 and 2018, survey respondents indicated a high level of satisfaction with Kremmling as a place to live.



In addition to their satisfaction with Kremmling as a place to live, respondents were asked to describe their personal level of involvement in Kremmling or local area activities or events on a scale from 1 (not active) to 5 (very active). Mean responses for community participation are indicated in

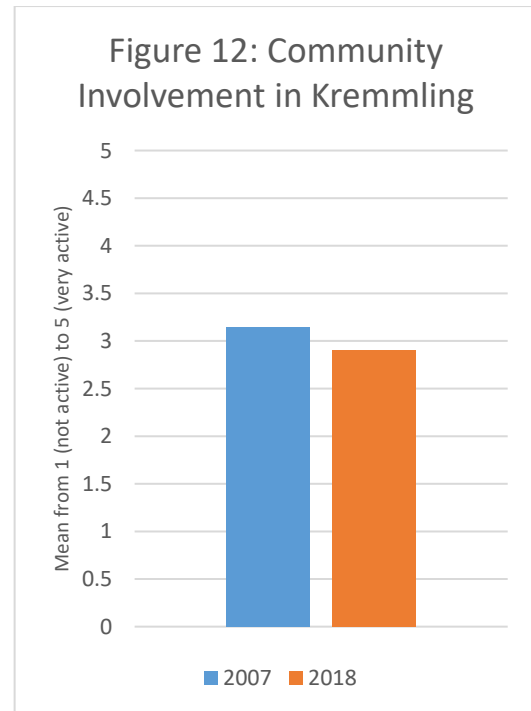


Figure 12. In 2007, respondents indicated a moderate level of personal participation in Kremmling community or local area activities (mean greater than 3.0). Notably, the 2018 survey respondents indicated lower levels of community involvement compared to 2007.

Respondents were asked to rate certain aspects of community life on a scale from 1 (very poor) to 5 (excellent). Mean responses are indicated in Figure 13. In 2018, Kremmling respondents indicated moderately positive views of “quality of life” and “place to visit or recreate” (means around 4.0), as well as slightly positive views in “providing necessary service”,

“local economy”, and “level and quality of communication among residents” (means in the range of 3.1 – 3.4). Generally, respondents indicated more positive views of the various aspects of community life in Kremmling, as compared to the 2007 responses, with the exception of a poorer rating for “availability of affordable housing”.

