



MOUNTAIN PINE BEETLES AND COLORADO FORESTS

Steamboat Springs Community 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 Steamboat Springs.

In 2007, 4,027 survey questionnaires were mailed to randomly selected households with addresses in the study communities. 1,346 completed surveys were returned (138 surveys received from Steamboat Springs), 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, 133 of the 1,130 completed surveys were received from Steamboat Springs. Findings from the 2018 survey were compared to 2007 survey results to assess how attitudes and actions within Steamboat Springs 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 Steamboat Springs 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 Steamboat Springs

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 Steamboat Springs area indicated perceiving higher degrees of tree mortality (mean response 3.0 compared to 2.3 in 2007), but also perceived more natural regeneration (mean response 2.9 compared to 2.5 in 2007).

Figure 1: Perceptions of Tree Mortality

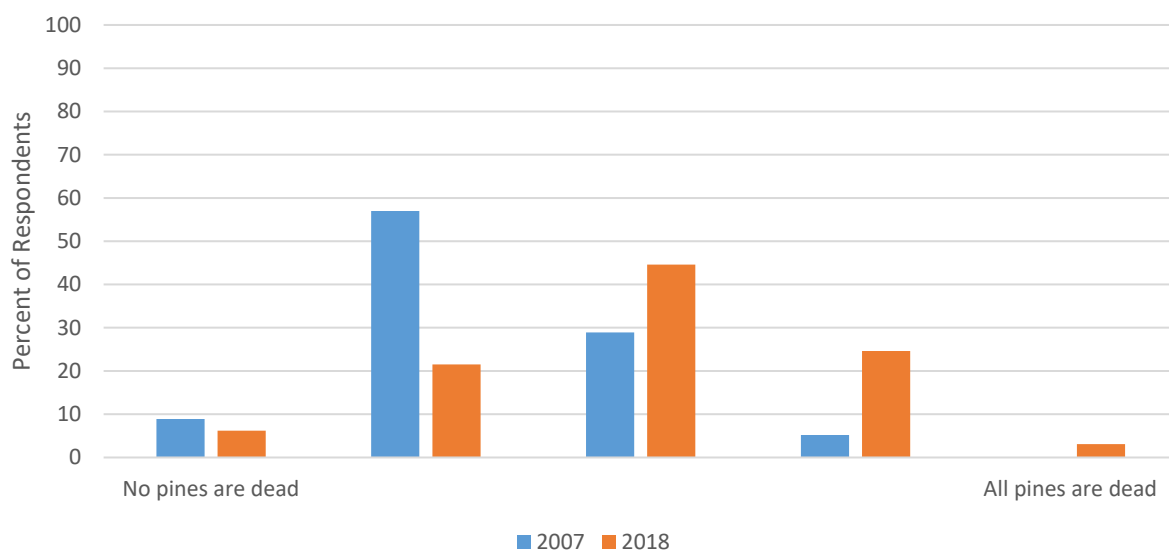
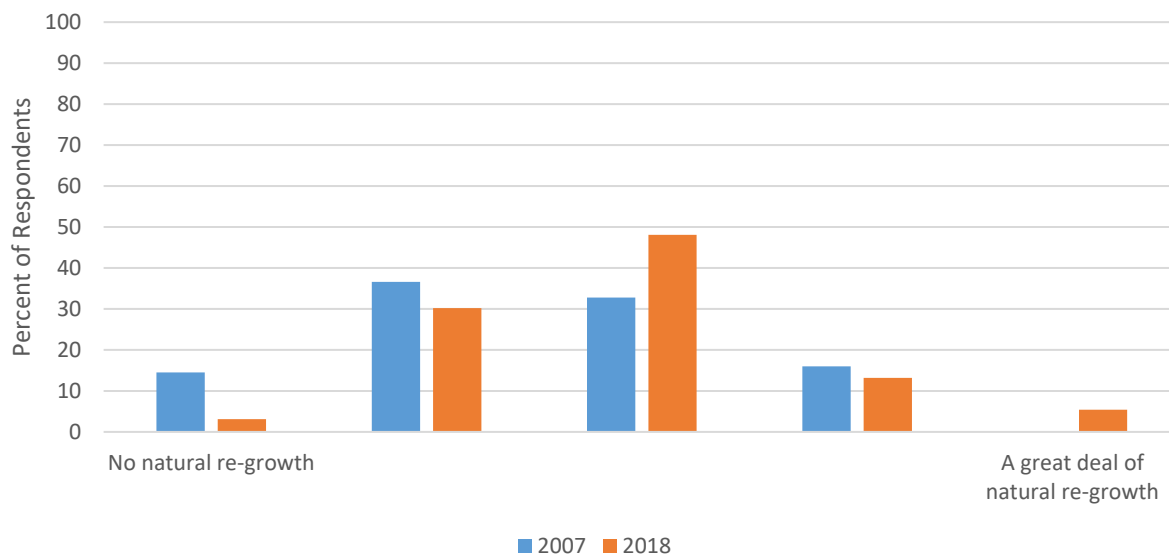


Figure 2: Perceptions of Natural Regeneration



In both years, Steamboat Springs respondents were asked to identify and 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”, “affected property values”, and “conflict over land use”.

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. Similar to 2007, only “availability of firewood” and “increased ecological awareness” were indicated as positive impacts of mountain pine beetles (having a mean larger than 3.5). Survey respondents also had slightly more positive views in 2018 regarding some impacts such as “availability of firewood”, “logging and land clearing”, and “soil erosion and runoff”, as compared to the 2007 survey. Notably, respondents had slightly less positive or more negative views regarding “increased ecological awareness”, “tree and forest accessibility”, “tree clearing costs”, and “emotions such as worry, fear, or anxiety”.

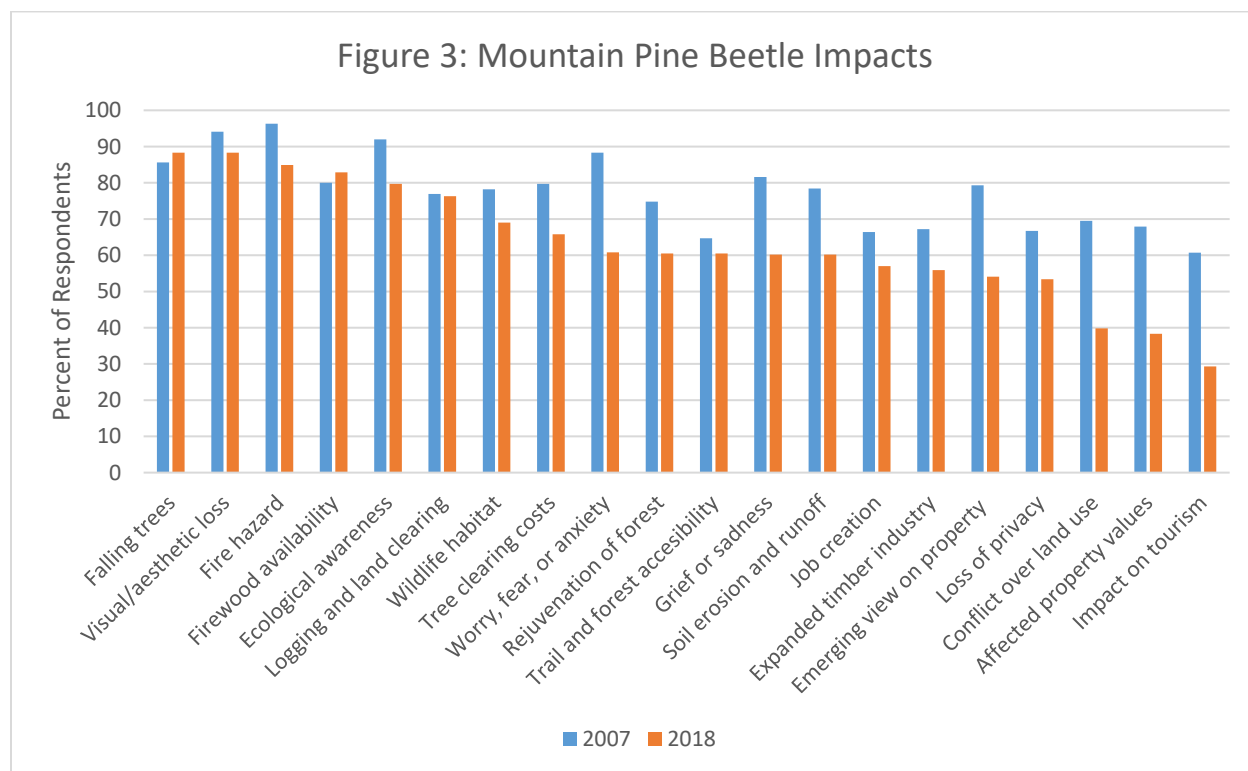
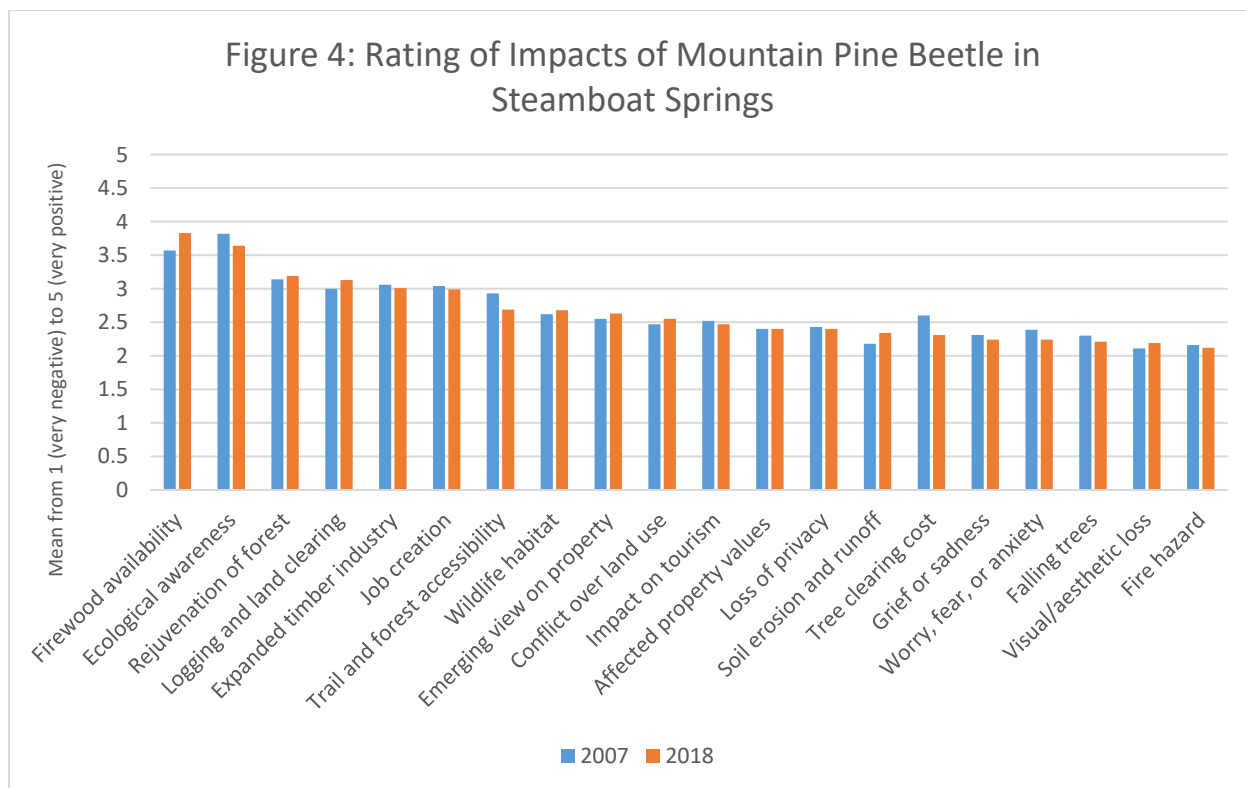


Figure 4: Rating of Impacts of Mountain Pine Beetle in Steamboat Springs



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 remained generally elevated, respondents expressed less concern about most issues compared to

2007, with the exception of “falling trees”, which was shown to be of greater concern to 2018 respondents. In 2018, the highest rated concerns were “forest fire”, “loss of scenic/aesthetic quality”, and “falling trees”. The lowest rated concerns for the area were “impact on livestock grazing”, “loss of community identity”, and “impact on property values”.

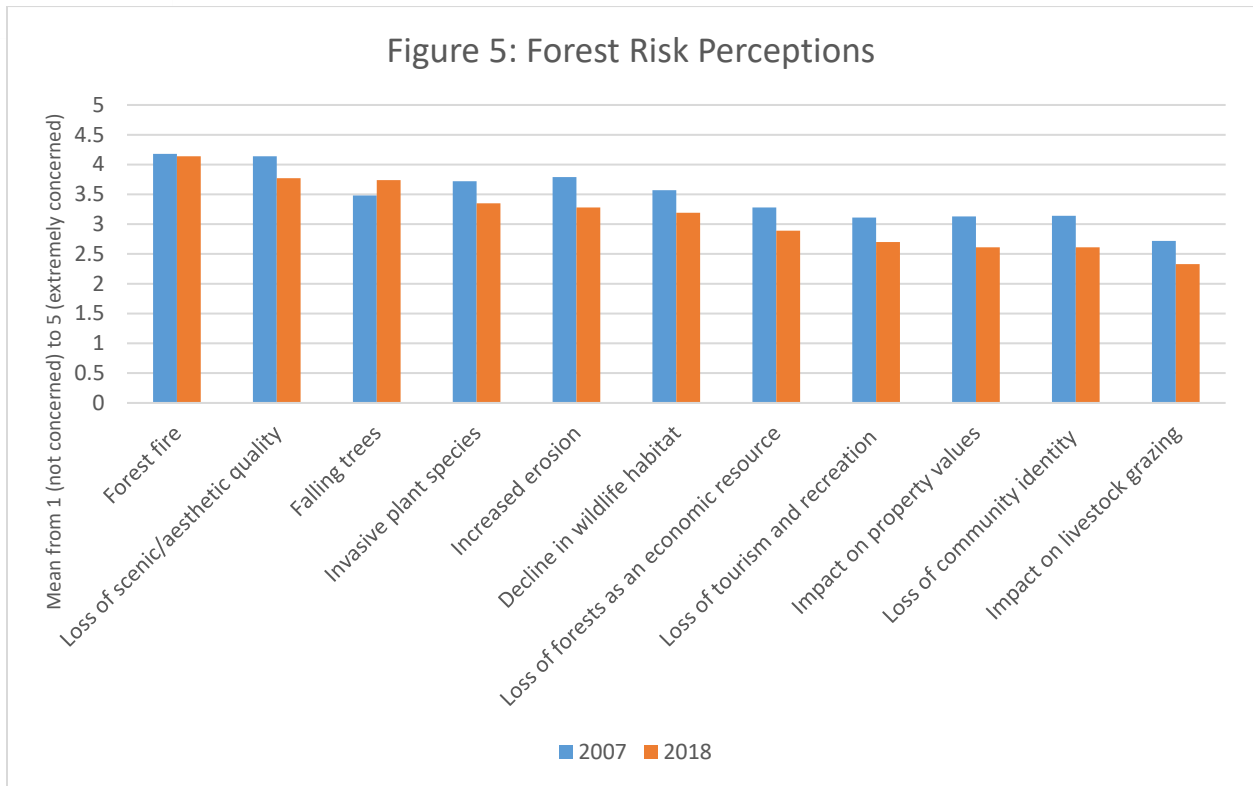
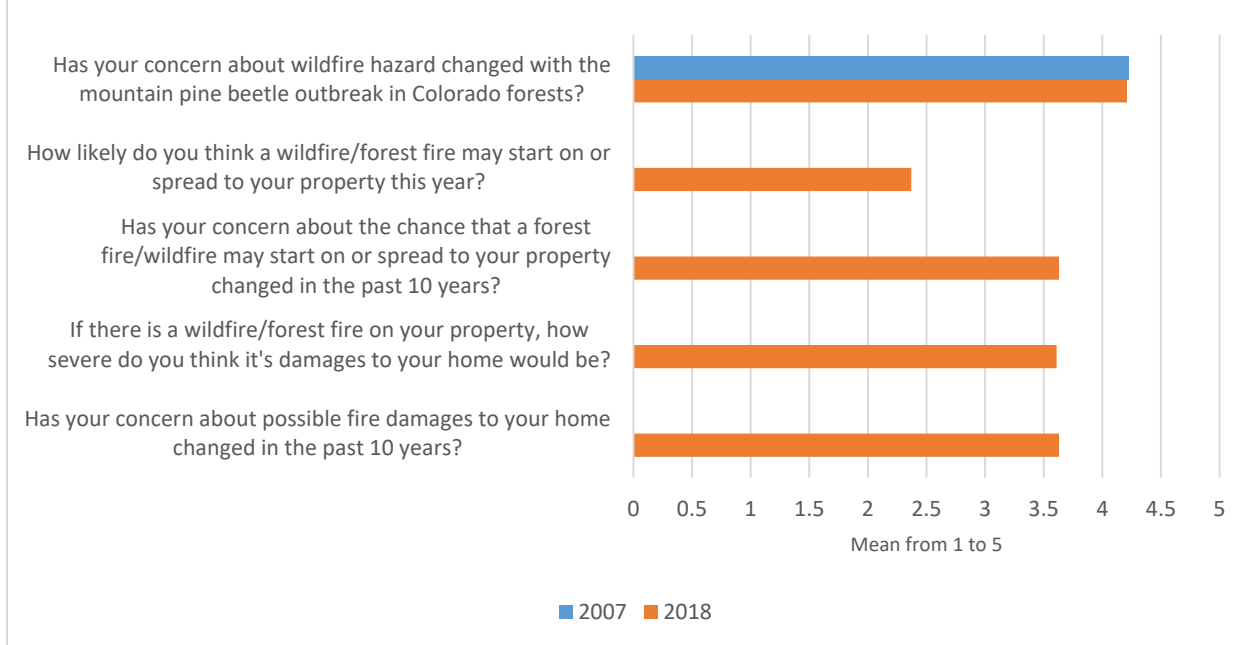


Figure 6 shows perceptions of wildfire risk. For the questions “has your concern about wildfire hazard changed with the mountain pine beetle outbreak in Colorado forests,” “has your concern about the chance that a wildfire/forest fire may start on or spread to your property changed during the past 10 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 increased level of concern regarding wildfire risks with the mountain pine beetle outbreak (mean of 4.2 in both years). In the 2018 survey, the respondents also indicated elevated levels of concern (mean larger than 3.5) over the past 10 years regarding the chance a forest fire/wildfire may start or spread to their property and the severity of possible fire damages to their home.

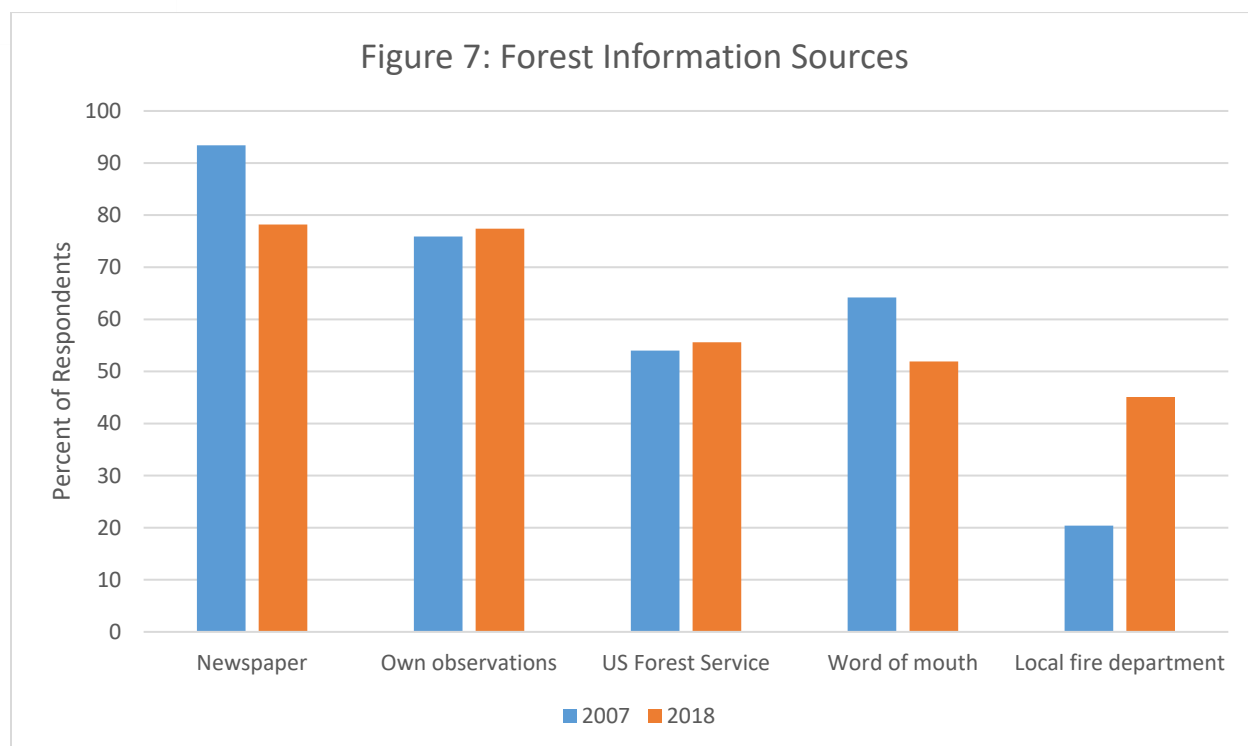
Figure 6: Perceptions of Wildfire Risk



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

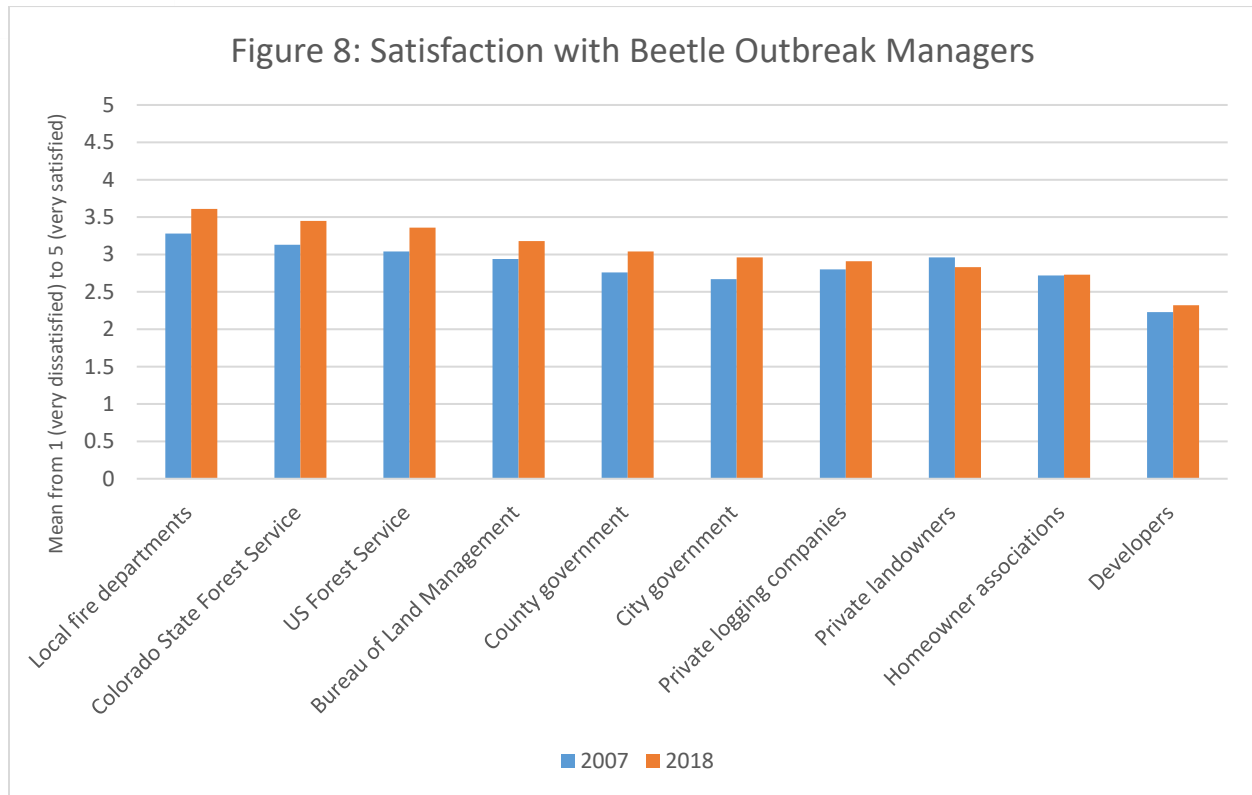
“newspapers”, “own observations”, and “US Forest Service”. Notably, in the 2018 survey, respondents in the Steamboat Springs area reported a decreased reliance on “newspapers” and “word of mouth” but an increased reliance on “local fire department” compared to 2007.



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. Steamboat Springs area respondents generally indicated satisfaction (mean around 3.5) with “local fire

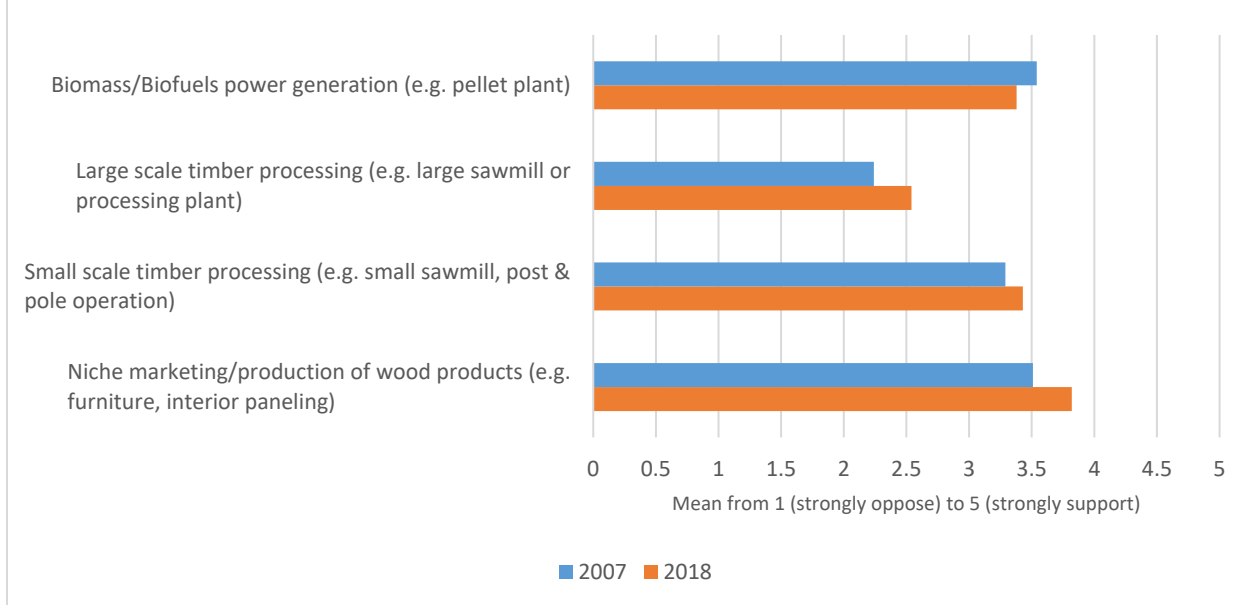
departments”, “Colorado State Forest Service”, and “US Forest Service” in the resurvey. In 2018, respondents indicated higher levels of satisfaction (or less dissatisfied) with all management entities, with the exception of “private landowners” and “homeowner associations”, as compared to the 2007 survey.



Respondents were also asked to indicate their level of support for several industry options in or near Steamboat Springs, 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, on average respondents were moderately supportive of all industry options other than “large scale timber processing”. In general, support for industry options increased from 2007 to 2018 surveys. While support for “biomass/biofuels power generation” remained moderately high, the 2018 respondents reported lower level of support for this industry option compared to 2007.

Figure 9: Support for Forest Industry

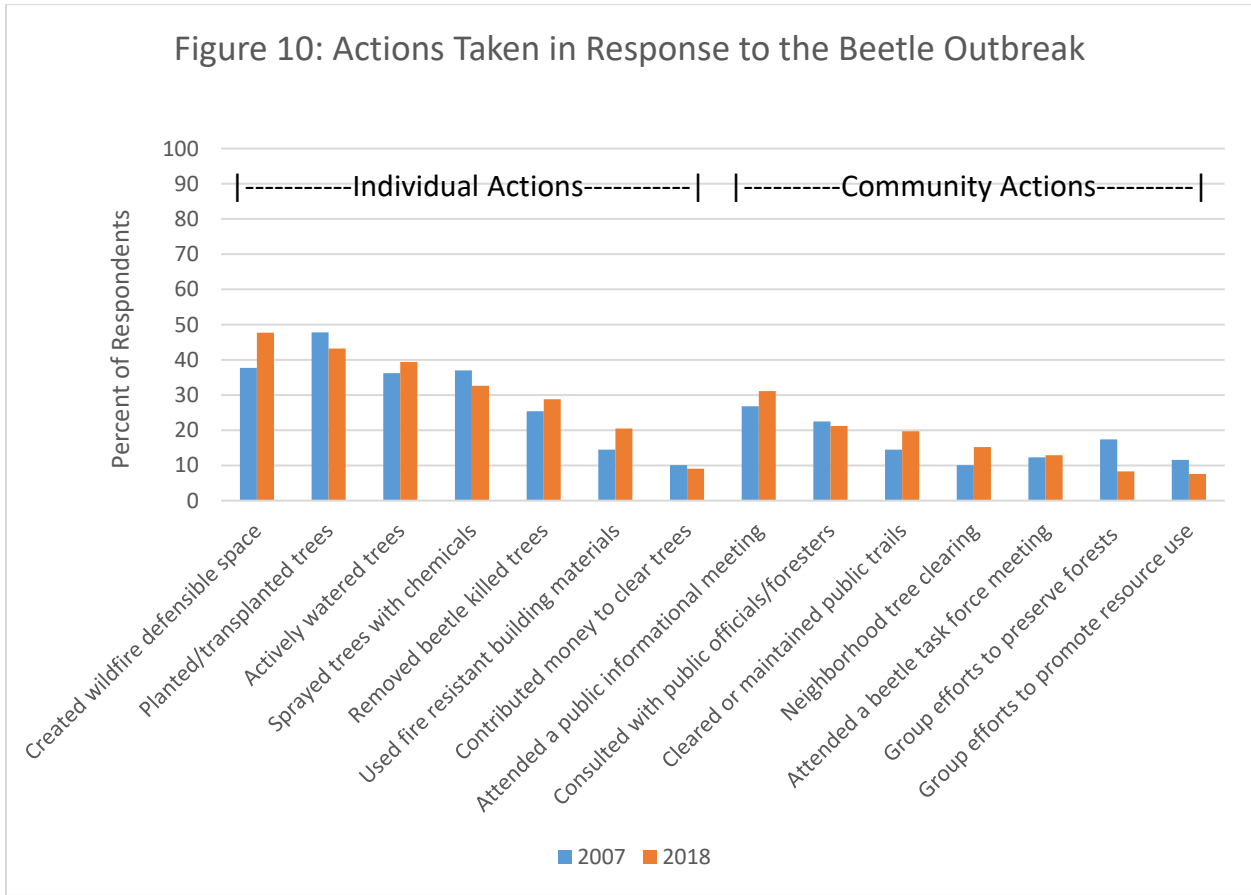


Response to the Beetle Outbreak

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. Overall, for both years, 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, planting/transplanting trees, and watering trees were the most actively reported activities for respondents in both 2007 and 2018. Creating wildfire defensible

space replaced planting/transplanting trees as the most frequent individual activity in the 2018 survey responses compared to 2007. Notably, in 2018, lower levels of planting/transplanting trees and spraying trees with chemicals, insecticides or pheromones were indicated by respondents, while similar or increased levels of other individual actions were reported. Regarding community responses, the resurvey respondents reported sustained or increased participation in public informational meetings or beetle task force meetings, neighborhood efforts to clear trees, and public trail clearing or maintenance, but decreased level of other community actions, as compared to the 2007 survey.

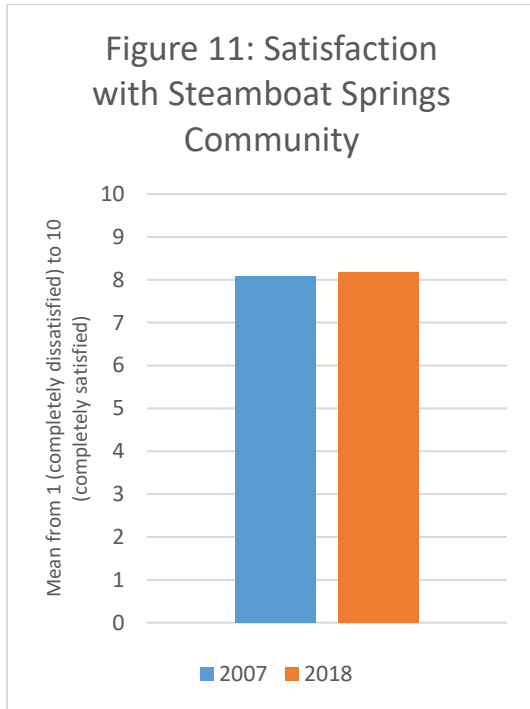
Figure 10: Actions Taken in Response to the Beetle Outbreak



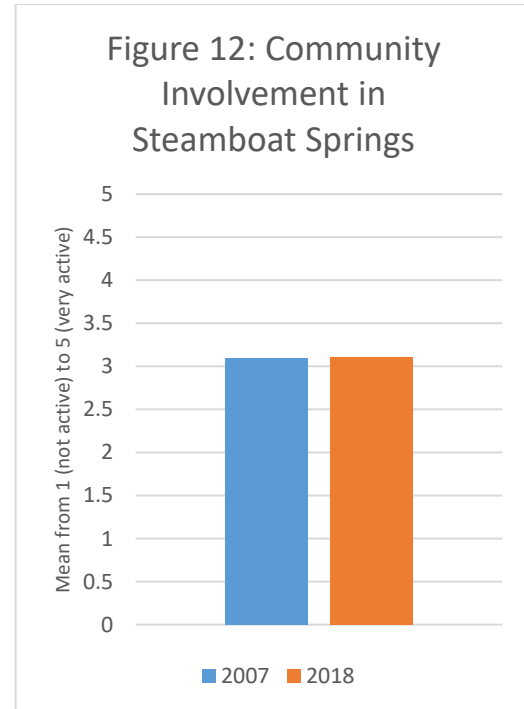
Community Experience and Participation

Both surveys also contained questions related to respondents’ experience and participation in Steamboat Springs. Respondents were asked to indicate their level of satisfaction with Steamboat Springs 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 Steamboat Springs as a place to live.



In addition to their satisfaction with Steamboat Springs as a place to live, respondents were asked to describe their personal level of involvement in Steamboat Springs 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 both 2007 and 2018, respondents indicated a moderate level of personal participation in Steamboat Springs community or local area activities.

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, Steamboat Springs respondents indicated all surveyed community attributes as positive (greater than 3.5), with the

exception of “availability of affordable housing”. Generally, respondents indicated similar views of the various aspects of community life in 2018, as compared to the 2007 responses, with the exceptions of slightly higher ratings for “providing necessary services”.

