MOUNTAIN PINE BEETLES AND COLORADO FORESTS

Walden 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 Walden.

In 2007, 4,027 survey questionnaires were mailed to randomly selected households with addresses in the study communities. 1,346 completed surveys were returned (210 surveys received from Walden), 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, 135 of the 1,130 completed surveys were received from Walden. Findings from the 2018 survey were compared to 2007 survey results to assess how attitudes and actions within Walden 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 Walden 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 Walden 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 Walden area indicated perceiving higher degrees of tree mortality (mean response 3.9 compared to 3.4 in 2007), but also perceived more natural regeneration (mean response 2.7 compared to 2.3 in 2007).

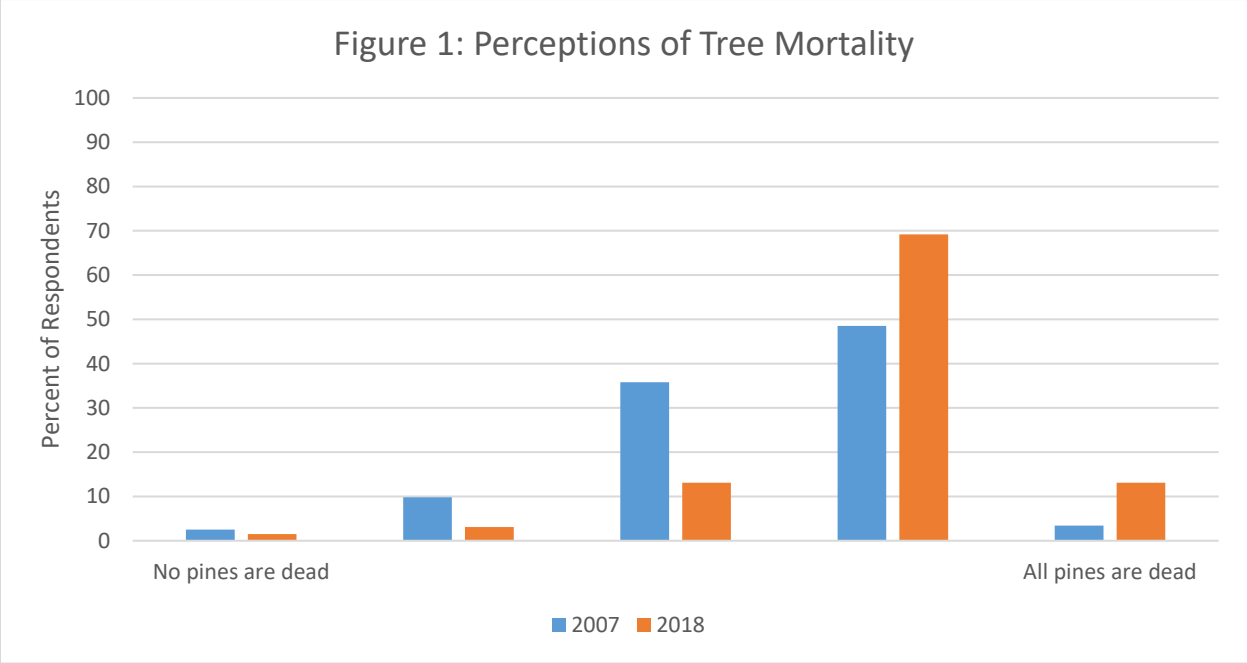


Figure 1: Perceptions of Tree Mortality
Percent of Respondents
100
90
80
70
60
50
40
30
20
10
0
No pines are dead
All pines are dead
2007
2018

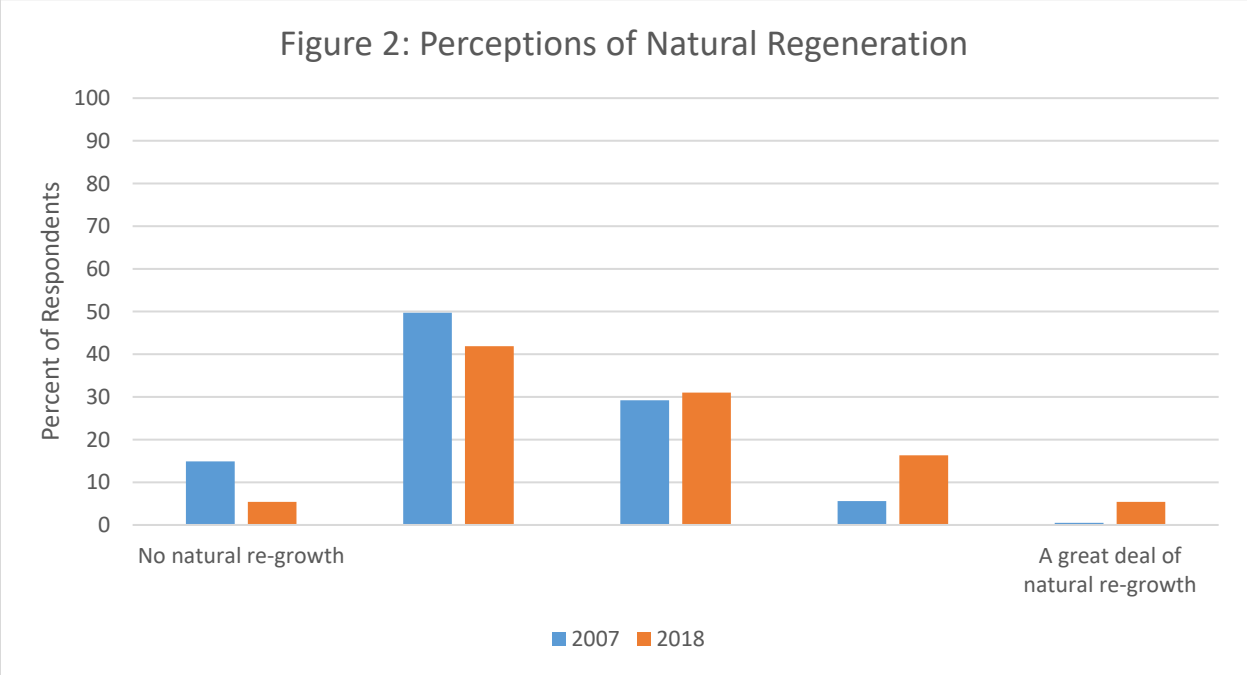
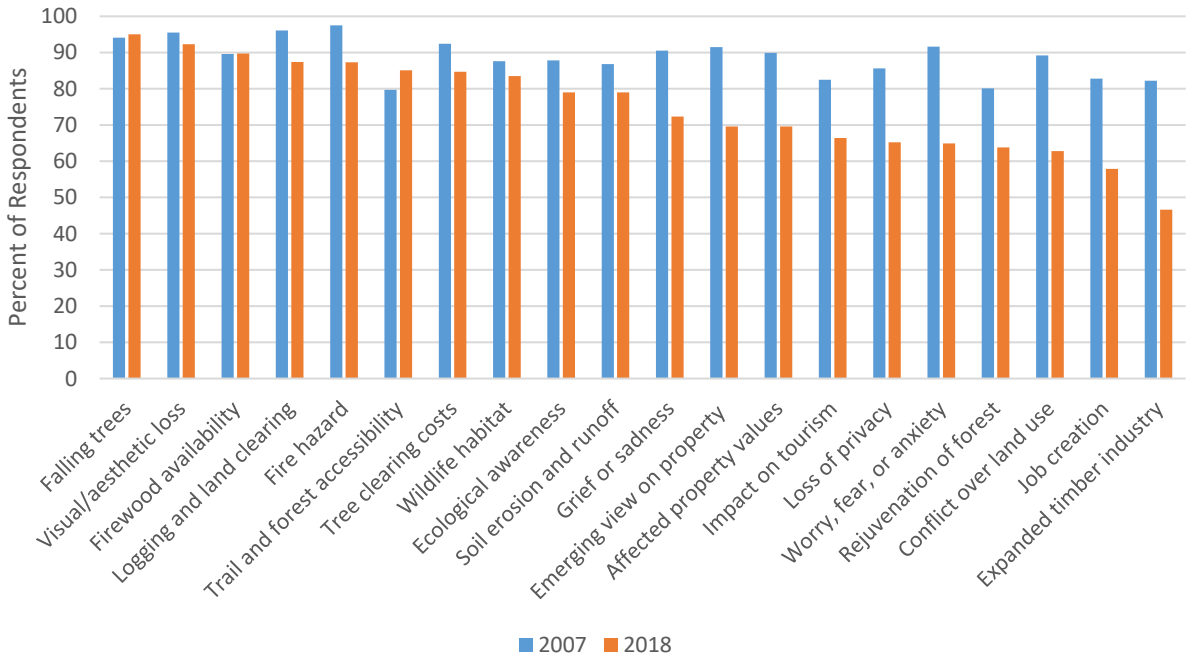


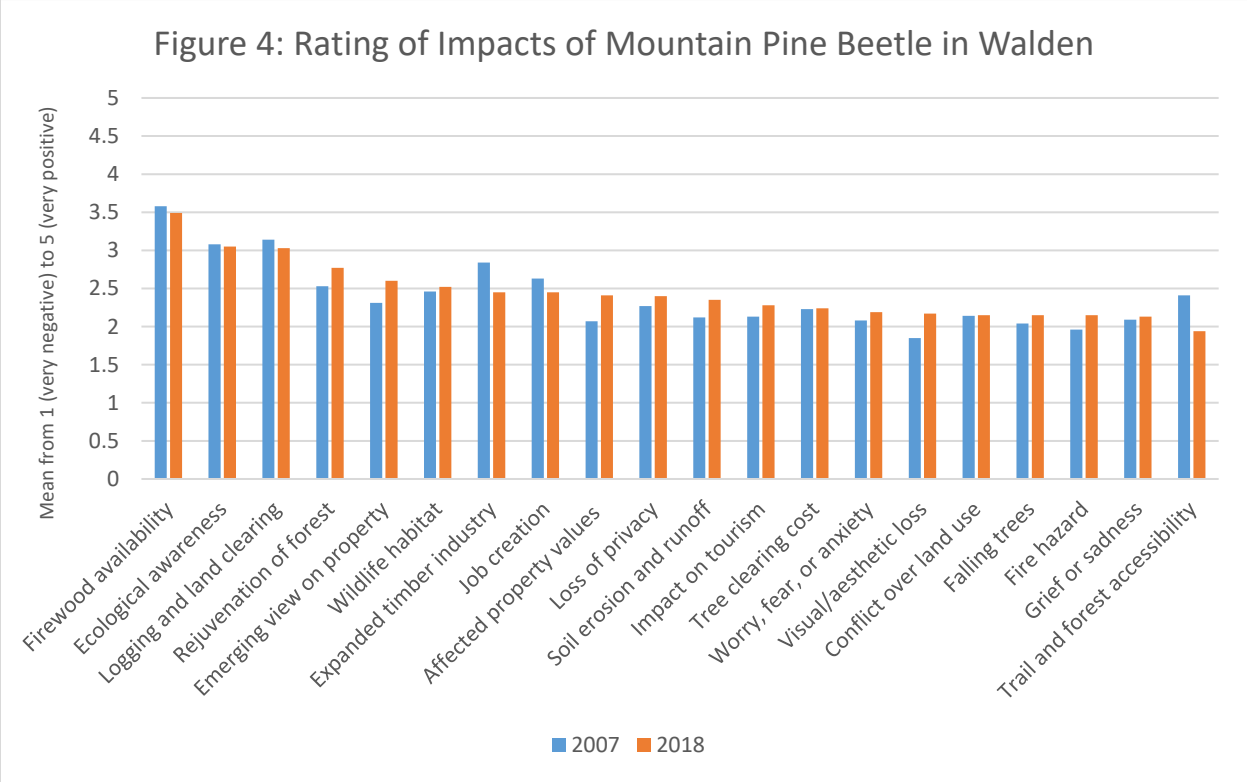
Figure 2: Perceptions of Natural Regeneration
Percent of Respondents
100
90
80
70
60
50
40
30
20
10
0
No natural re-growth
A great deal of natural re-growth
2007
2018

In both years, Walden 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 "availability of firewood". The least frequently indicated impacts in 2018 were "expanded timber industry", "job creation", 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. Only "availability of firewood" was indicated as a positive impact of mountain pine beetles (having a mean of 3.5). Survey respondents also had slightly more positive (or less negative) views in 2018 regarding many impacts such as "forest rejuvenation", "emerging view on property", "affected property values", "soil erosion and runoff", "visual/aesthetic loss", and "fire hazard", as compared to the 2007 survey. Notably, respondents had more negative views regarding "expanded timber industry", "job creation", and "trail and forest accessibility".

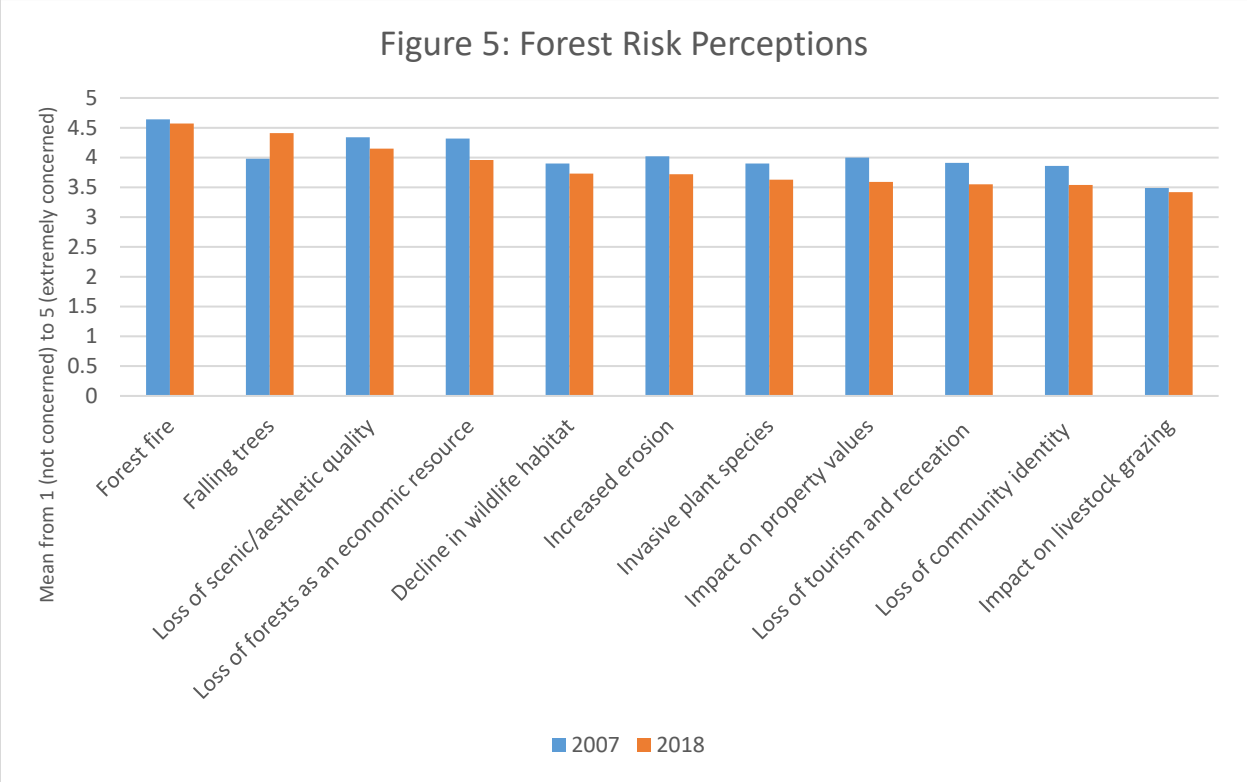
Figure 3: Mountain Pine Beetle Impacts





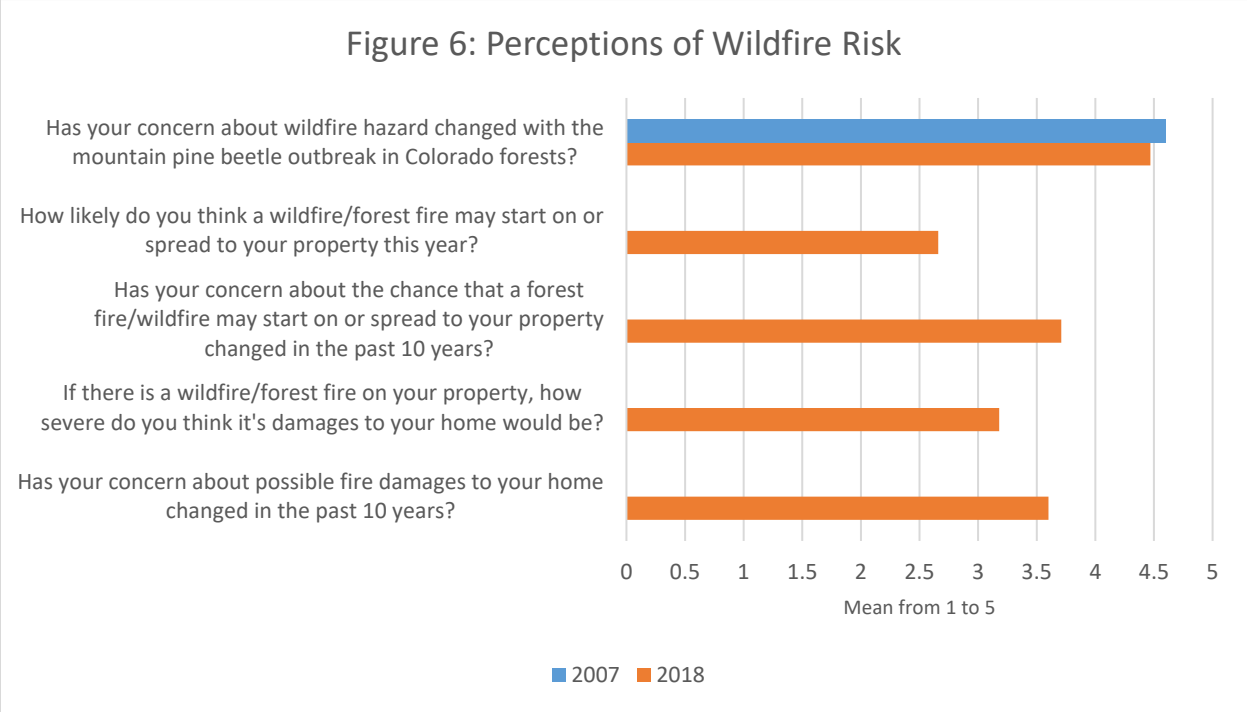
Forest Risk Perceptions

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”, “falling trees”, and “loss of scenic/aesthetic quality”. The lowest rated concerns for the area were “impact on livestock grazing”, “loss of community identity”, and “loss of tourism and recreation opportunities”.



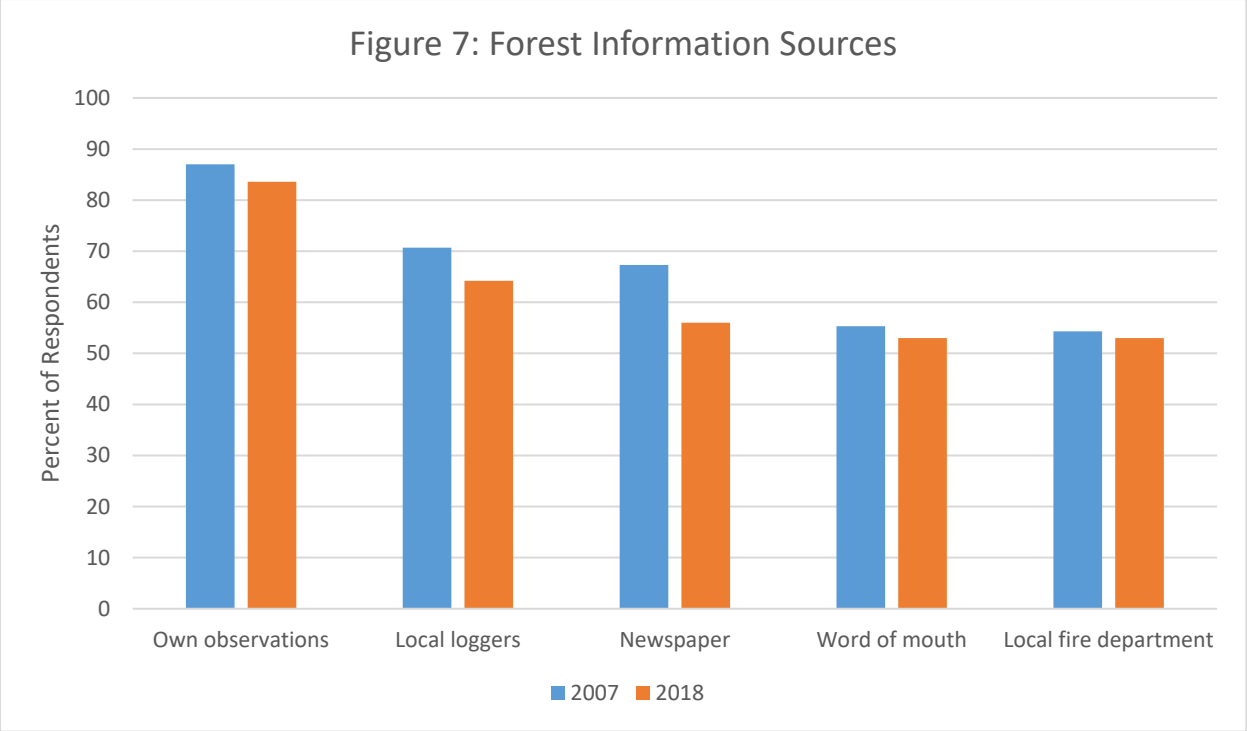
For the questions "has your concern about wildfire hazard changed with the mountain pine beetle outbreak in Colorado forests," "has your concern about the chance that a wildfire/forest fire may start on or spread to your property changed during the past 10 years," and "has your concern about possible 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. 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.



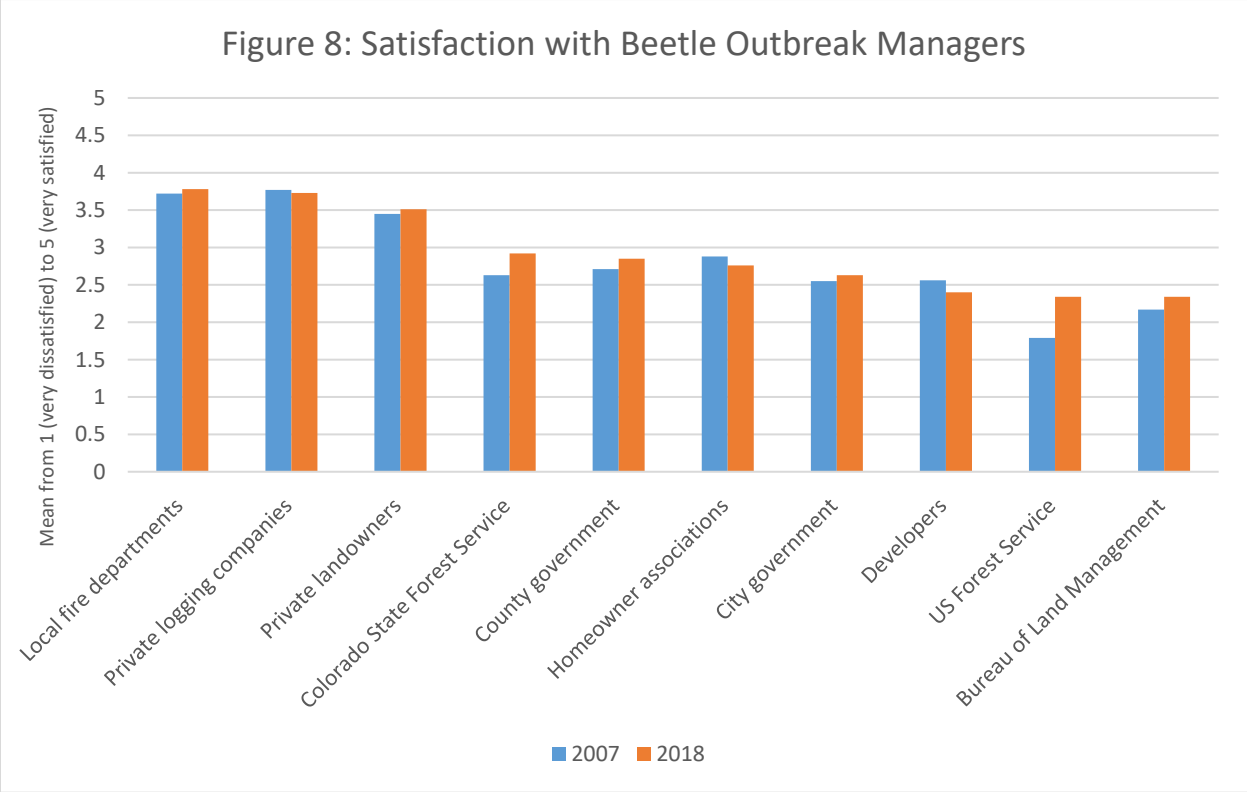
Sources of Forest Information

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”, “local loggers”, and “newspapers”. In the 2018 survey, respondents in the Walden area reported a slightly decreased reliance on each of the top five sources of forest information, as compared to the 2007 survey.



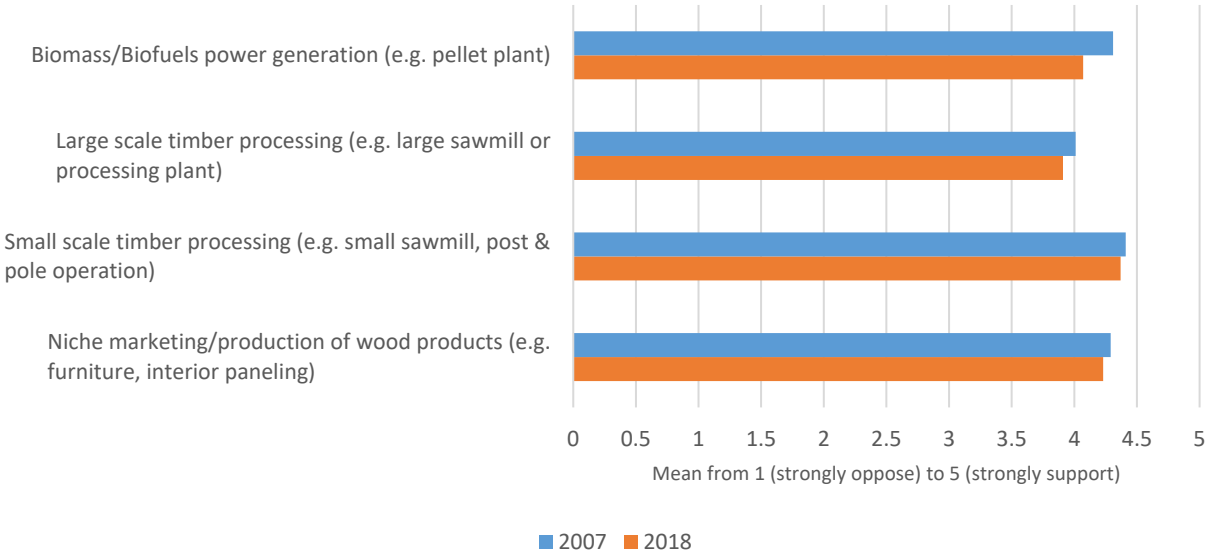
Satisfaction with Management

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 “local fire departments”, “private logging companies”, and “private landowners” in the 2018 survey. Notably, Walden area respondents in 2018 indicated higher levels of satisfaction (or less dissatisfied) with “county government”, “Colorado State Forest Service”, “US Forest Service”, and “Bureau of Land Management”, as compared to the 2007 survey.



Respondents were also asked to indicate their level of support for several industry options in or near Walden, 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 moderately 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. Both 2007 and 2018 respondents indicated a lower level of support for "large scale timber processing", and while support for "biomass/biofuels power generation" remained moderately high, the 2018 respondents reported lower levels of support for this industry option compared to 2007. "Small scale timber processing" was the most supported option for respondents in 2007 and 2018. In general, support for industry options decreased from 2007 to 2018 surveys.

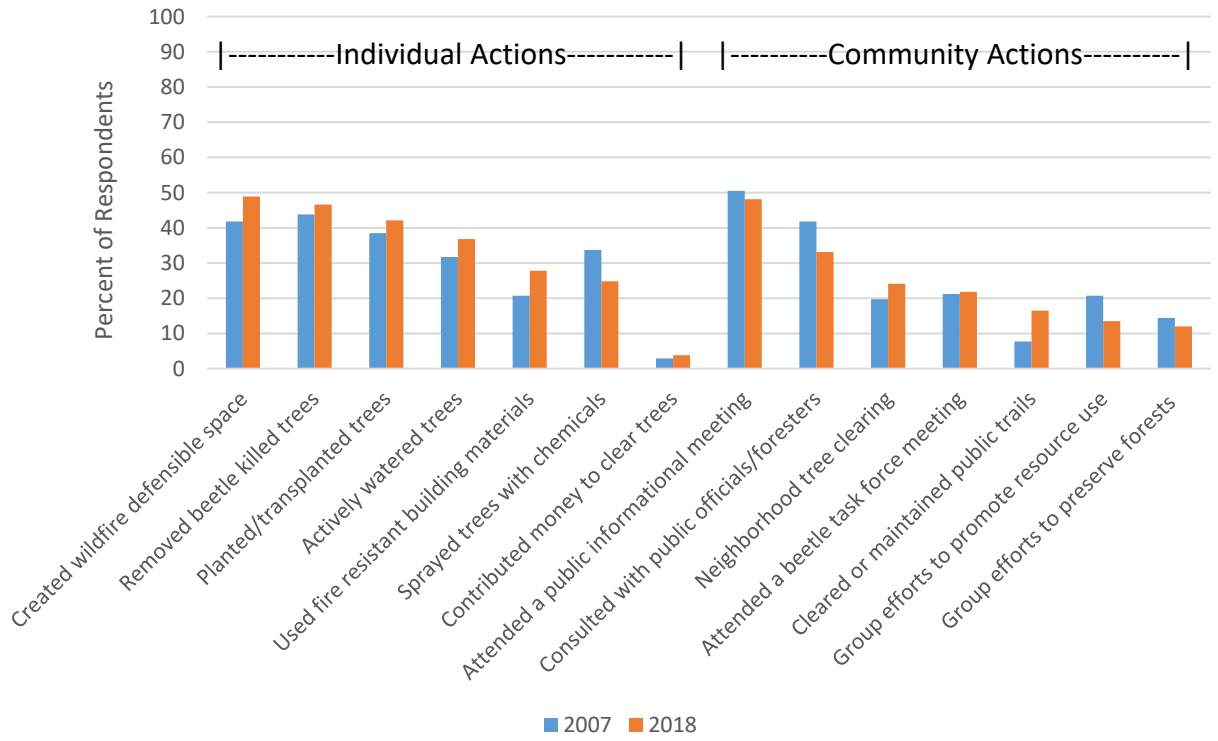
Figure 9: Support for Forest Industry



Response to the Beetle Outbreak

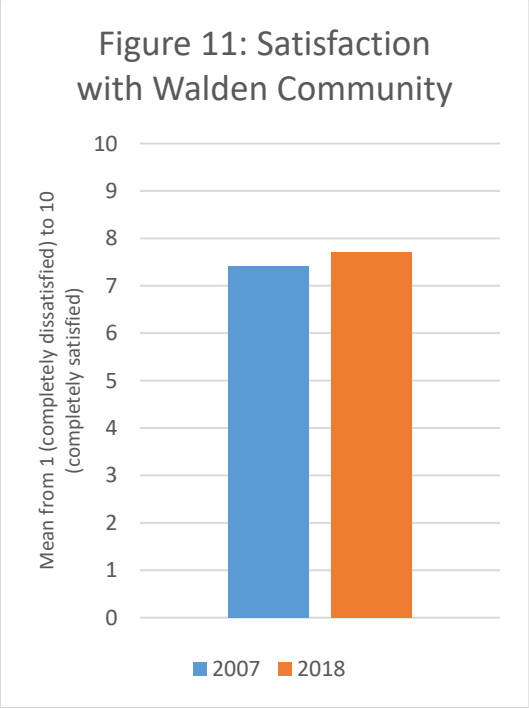
Respondents were asked to indicate if they had participated in a series of actions in response to the mountain pine beetle outbreak. Figure 10 shows the percent of all respondents who undertook various activities, both as individuals and as part of community efforts. For both years, the proportion of 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). However, notably, "attended a public informational meeting" was reported by nearly half the respondents in both 2007 and 2018. For individual actions, creating wildfire defensible space near structures, removing beetle killed trees, and planting or transplanting trees were the most actively reported activities for respondents in both 2007 and 2018. Creating wildfire defensible space replaced removing dead trees as the most frequent individual activity in the 2018 survey responses compared to 2007. The resurvey respondents reported increases in all individual actions except for spraying trees with chemicals, insecticides or pheromones. Regarding community responses, 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 decreases in consultations with public officials/foresters and group efforts to promote resource utilization in 2018, as compared to the 2007 survey.

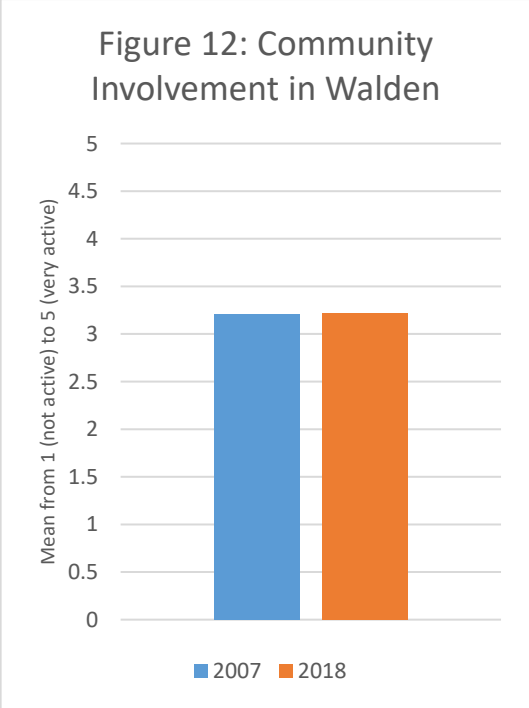
Figure 10: Actions Taken in Response to the Beetle Outbreak



Community Experience and Participation

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





In addition to their satisfaction with Walden as a place to live, respondents were asked to describe their personal level of involvement in Walden 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, Walden respondents indicated a moderate level of personal participation in 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. Generally, respondents indicated similar views of the various aspects of community life in 2018, as compared to the 2007 responses, with the exception of a poorer rating for "availability of affordable housing" and an improved rating for "local economy". In 2018, Walden respondents also indicated slightly less positive views of "quality of life" and "place to visit or recreate". However, the mean ratings for these two community attributes as reported by respondents remained positive (greater than 3.5).

Figure 13: Walden Community Attributes