Overcoming Barriers to Firewise Actions by Residents

Final Report

JFSP Project Number 10-3-01-15, entitled:
"Overcoming Barriers to Defensible Space Behaviors"

July 2013

Principal Investigators:

James D. Absher, US Forest Service, Pacific Southwest Research Station – Riverside
Jerry J. Vaske, Human Dimensions of Natural Resources, Colorado State University

Co-Authors:

Katie M. Lyon, Human Dimensions of Natural Resources, Colorado State University

This research was sponsored by the Joint Fire Science Program.
For additional information, visit www.firescience.gov.

ABSTRACT

Encouraging the public to take action (e.g., creating defensible space) that can reduce the likelihood of wildfire damage and decrease the likelihood of injury is a common approach to increasing wildfire safety and damage mitigation. This study was designed to improve our understanding of both individual and community actions that homeowners currently do or might take to protect their home or property, and the barriers that impede homeowners from completing firewise treatments to their home or property.

TABLE OF CONTENTS

1. BACKGROUND AND PURPOSE

1.1 Overview and Introduction

Recent wildfires in the western United States highlight the need for understanding the human dimensions of wildfire management, especially for policies and programs that affect property losses in the wildland urban interface (WUI). Absher, Vaske, and Shelby (2009): (a) reviewed key findings from past human dimensions research, (b) highlighted the practical consequences of adopting a theory-based approach to understanding wildland fire management in urbanized areas, and (c) suggested likely strategies for successful firewise programs. This report builds on this previous work by identifying the barriers that prevent residents in fire prone areas from adopting firewise behaviors, to both the area around the home (defensible space) and to the home itself (firewise construction). By better understanding residents' perceptions of their roles and responsibilities, the goal is to assist wildland fire managers in developing risk reduction programs.

Research has identified three broad categories of variables – socio-demographic, situational and psychological – that predict homeowner wildfire mitigation behaviors (e.g., defensible space, firewise construction). *Socio-demographic variables* such as age, sex, education, and income have been shown to be related to residents' perceptions of wildland fires and potential mitigation strategies (Absher et al., 2009). Individuals with more income, for example, have more personal resources to adopt some homeowner wildland fire mitigation strategies (e.g., firewise construction). *Situational variables* define a given context and influence what the public perceives as acceptable or feasible. Large tracts of forested land often surround homes built in the WUI. Proximity of a home to a forest is likely to enhance the homeowners' general awareness of the potential dangers associated with wildland fires and their willingness to accept mitigation efforts. *Psychological variables* include specific beliefs and attitudes regarding wildfires (e.g., perceived familiarity with, effectiveness and aesthetic impacts of wildfire or treatments, perceptions of risk, trust, responsibility).

These classes of predictors, however, do not contribute equally to homeowner mitigation behaviors. Theory predicts that *general* socio-demographic variables (e.g., education, income) and *general* situational variables (e.g., location of home) will account for less of the variability in homeowner wildland fire mitigation strategies and support for agency policies. More *specific* psychological variables (e.g., beliefs about effectiveness, aesthetics of mitigation efforts) and current behavior explain a relatively large amount of the variation. Current behavior, for example, has been shown to explain between 33% and 58% of the variation in behavioral response (Absher et al., 2009). These results suggest that engaging residents in doing some type of behavior, no matter how small, provides an important first step to broader adoption of firewise actions. Perceived familiarity, effectiveness, and aesthetic impacts (psychological variables) also have a strong and consistent influence on individual mitigation behaviors. This suggests that greater support for individual behaviors might be possible if the communication strategy enhances residents' knowledge and / or understanding of defensible space and firewise construction strategies.

Because taking actions to address the risk from wildland fire is both a personal and a community level issue, we included a measure of community context. The community psychology literature has developed a Sense of Community Index (SCI). The index consists of four interrelated constructs: (a) membership, (b) influence, (c) integration and fulfillment of needs, and (d) shared

emotional connection (McMillan & Chavis, 1986). To date no one has used the SCI in a firewise context.

1.2 Encouraging Action and Implementing Firewise Recommendations

Creating defensible space can reduce the likelihood of wildfire damage and decrease the likelihood of injury. Communication campaigns have been employed to describe how WUI residents can protect themselves and their homes from wildfire. In Colorado, one prominent example of an agency communication effort is Colorado's "Are You FireWise" Program. This information campaign, launched in 1998 by the Colorado State Forest Service (CSFS) in cooperation with Larimer County, Poudre Fire Authority, and Loveland Fire Department includes a package of instructional materials that provide information to residents on how to take steps to be firewise around their home. Included in this information package are a set of flyers that describe seven components of firewise behavior. Specific topics include: Access, Water Supply, Defensible Space, Trees and Shrubs, Construction Materials and Design, Interior Safety, and What to Do When.

Respondents in earlier studies (e.g., Absher et al., 2009) indicated partial compliance with 26 key recommendations contained in the seven firewise flyers. Respondents also reported obstacles to adopting firewise behaviors across all topics and actions presented in the flyers. In total, 48% of respondents identified an obstacle for at least one of the recommended actions. Although many of the obstacles appeared across several firewise topics, their prevalence and context varied widely by the specific actions and suggest that a deeper understanding of the barriers is needed. For example, some respondents believed that pruning trees would negatively impact the aesthetics of their property. Actions related to plant arrangement and accumulation of flammable debris were met with concerns over maintaining natural vegetation and the amount of work associated with these tasks in a forested landscape. Recommendations for using fire resistant materials for windows, decks, vents, and the roof caused some respondents to make statements emphasizing the expense of materials and labor.

1.3 Purpose

The overall objectives were to: (a) explore the extent to which respondents engage in specific firewise behaviors and (b) examine barriers to implementing firewise behaviors. Consistent with previous research, three sets of predictors were examined: (a) socio-demographics (e.g., age, income), (b) situational variables (e.g., membership in a homeowners association), and (c) psychological factors. Included in this latter category were beliefs about perceived responsibility, legal considerations, and sense of community; and perceived barriers to adopting defensible space actions.

2. STUDY DESCRIPTION AND LOCATION

This project built on a previous survey of Colorado residents. A random sample of households in 12 Colorado counties was selected for participation in this study. These counties included: Bent, Otero, Las Animas, and Huerfano Counties in southeast Colorado; Alamosa, Conejos, and Costillo counties in south-central Colorado; Montrose, San Miguel, Archuleta, and La Plata Counties in southwest Colorado; and Yuma County on the eastern plains. The study area is a mixture of rural, semi-rural and small urban areas, and contains a variety of lifestyles and

interests. After accounting for bad addresses, a total of 3,797 individuals were sent a survey. Of these, 863 completed the questionnaire for a 23% overall response rate[1].

Data collection for this study employed a modified version of Dillman's Tailored Design Method for conducting mixed-mode surveys (Dillman, Smyth, & Christian, 2009). Respondents were provided with two options for completing the survey: (a) a Web-based version and (b) a paper-based version. An introductory letter containing a link to the Web-based version was sent first, followed by a reminder postcard, and two full questionnaire mailings. Data collection occurred between November 2011 and February 2012. The full mailings also contained the link for the Web version. Approximately 34% of the respondents completed the Web-based version, and 66% completed the mail version.

The results reported here are based on respondents who: (a) live in either a single family house, detached from any other house, or a manufactured/mobile home and (b) own the property on which the home is located (n = 740).

3. KEY FINDINGS

3.1 Respondent Demographics, Property Characteristics & Wildland Fire Experiences

The survey measured socio-demographic characteristics and variables that describe the resident's property and wildland fire experiences.

- Seventy percent of the respondents were male and were on average 60 years old (Appendix A, Table 1). Nearly one third (32%) had a college degree and many held masters or doctoral degrees (23%).
- For purposes of the analyses in this report, we selected only those respondents who owned their property (n = 740) (Table 2). Nearly all of these individuals considered the address where we sent the survey to be their primary residence (97%) and almost as many live at this residence year round (94%). Over 90% described their residence as a single-family house, detached from any other structure. About half (54%) had been involved in the original design or renovations of the residence.
- Two-fifths (42%) lived within a forested area, and another 16% were within a mile of the forest area, so that over half are at risk from flame or embers during a strong wildland fire. Nearly half (48%) indicated that their residence was in a subdivision, and over a third (35%) said they belonged to a homeowners association.
- On average, people had lived in this residence for 15.4 years (Table 2). The average lot size was 53.3 acres, but 17% of the properties were less than 1 acre and 10% owned more than 50 acres. Lot sizes ranged from .1 to 5,000 acres. The median lot size was approximately 7.8 acres.

[1] This response rate is consistent with that being reported by recent, similar studies. Budget precluded the inclusion of a separate non-response bias check. The socio-demographic profile results in the tables that follow are consistent with county wide data, although this sample is focused on a subset or residents in the urban interface, and they may be slightly different than statewide or county-by-county profiles.

- Respondents described the vegetation of their properties in a variety of ways; about a quarter said the trees on the property were widely dispersed and another quarter indicated that they had many trees that were touching (Table 3). About a third described the slope of the land immediately around their residence as flat (34%); only 5% thought their property was steeply sloped.
- Using procedures described by the Colorado State Forest Service's firewise construction booklet (Bueche & Foley, 2012), the self-reported vegetation type and slope variables were combined to create a hazard rating (Table 3). Eleven percent of the properties were considered "no hazard," while 27% were estimated as either a "high hazard" (26%) or "very high hazard" (1%).
- Nearly two-thirds of the respondents (64%) had experienced discomfort from the smoke of a wildland fire (Table 4). Only 5%, however, had their residence damaged due to a wildland fire and even fewer (3%) had been injured as a result of a wildlife fire.
- Over half (52%) knew someone who had been evacuated from his / her home because of a wildland fire (Table 4). Less than a quarter (23%) knew someone who had been injured as a result of a wildland fire.

3.2 Participation in Community Activities

The survey listed 11 different community activities (e.g., attend community-based meetings related to wildland fire). Respondents were asked: (a) whether they currently participated in these activities and (b) how likely they were to participate in these activities in the future.

- Participation in fire-related community activities was low (Table 5). Respondents were most likely to work with neighbors to reduce the risk of wildland fire on their property or their neighbor's property (26%), obtain additional information on how to prepare for wildland fire (24%), or consult with professionals (23%).
- Only 15% indicated that they had participated in community-based meetings and / or public meetings about defensible space.
- Less than 10% helped to organize community education programs about wildland fire or participated in Firewise Council meetings.
- Of these, only 2% of the respondents participated in all 11 activities (Table 6). The majority (52%) participated in none of the activities. A quarter (27%) did between 1 and 3 of the activities.

3.3 Sense of Community

The questionnaire included 15 items that reflected a sense of community. After factor and item analysis, a 4-factor Sense of Community Index (SCI) was produced. These items reflect four broad latent concepts of: (a) home, (b) known, (c) shared perspectives, and (d) action (Table 7). The Cronbach's alpha for these concepts ranged from .83 to .91, indicating strong measurement reliability.

- Three-quarters or more felt a strong attachment to their community (i.e., both as a place to live and as their home).

- Equally as many felt that they can recognize others who live nearby and that this is reciprocated, so that neighbors in their community recognize each other (i.e., there is a sense of on-sight recognition or being known).
- Between 53% and 77% thought that people in the neighborhood felt a sense of community and shared the same values (i.e., there is a sense of cohesion or shared perspectives).
- Between 48% and 61% believed that community members would work together to solve problems (i.e., there is a sense that you are influenced by and influence others to take actions for personal and community good).

3.4 Beliefs about Fire Protection and Firewise Activities

Respondents were asked the extent to which they agreed or disagreed with 10 belief statements representing two broad latent constructs: (a) perceived responsibility and (b) legal considerations (Table 8). The responsibility belief focused on who is responsible for protecting homes built in or near the WUI and who is responsible for managing the risk of wildfire (e.g., private landowners, public agencies). Beliefs about legal considerations referred to the extent that private landowners should be free to or constrained from building private residences in or near the WUI where wildfire may occur.

- Over 90% believed that homeowners are most responsible for protecting their home from wildfire. A quarter or less agreed that land management agencies (21%) or local fire departments (25%) are primarily responsible for protecting private homes and property.
- More than one-half (68%) of respondents would oppose laws preventing people from building homes in areas where they might be threatened by wildland fire.
- Respondents tended to support laws requiring new home construction to include the use of fire resistant materials (60%); however, a large proportion (55%) agreed that use of such materials should be voluntary.
- Respondents generally believed that doing firewise construction (51%) and defensible space (55%) should be voluntary, although 52% believe homeowners should be required to take steps to protect their homes from wildfire.

3.5 Perceptions of Wildland Fire Risk

Respondents were asked about the likelihood of a wildfire occurring in the near future (a) at their home/property and (b) in the neighborhood/community in which they live.

- Two-thirds of respondents thought that their own residence was not at all (27%) or slightly (39%) likely to be at risk from wildfire. Only 8% felt that fire was extremely likely to occur at their residence / property (Table 9).
- Conversely, over half believed that the likelihood of fire was moderately (32%) or extremely (19%) likely to occur in the community in which they live.

3.6 Defensible Space Beliefs and Actions

The questionnaire contained three questions about defensible space in general (i.e., familiarity, safety, aesthetics). The questionnaire also asked respondents about 10 specific defensible space activities (e.g., current behavior, perceived effectiveness, future intentions).

3.6.1 General Beliefs and Attitudes about Defensible Space

- Respondents were moderately (39%) to extremely (46%) familiar with defensible space activities (Table 10).
- Ninety-two percent indicated that they believed defensible space activities would make their home/property moderately (23%) to extremely (71%) safer in the event of a wildland fire.
- Sixty-nine percent of respondents indicated that defensible space activities would make their home/property look better.

3.6.2 Specific Beliefs about Perceived Effectiveness of Defensible Space Recommendations

- Between 79% and 93% believed that these recommended actions were moderately to extremely effective (Table 11). On average, all recommendations were viewed as being at least moderately effective.
- Removing dead limbs, leaves, and other debris within 75 feet of your residence (93%), removing flammable vegetation from within 15 feet of all structures (92%), and reducing the density of trees within 75 feet of the residence (91%) were seen as the most effective recommendations.

3.6.3 Reported Defensible Space Behaviors

- One-half or more of the respondents indicated that they had mowed grasses/weeds; removed dead limbs, leaves, and other debris within 75 feet of their residence; trimmed branches that extend over their roof; cleaned roof surfaces/gutters; removed all flammable vegetation from within 15 feet of all structures, reduced the density of trees within 75 feet of their residence, and stacked firewood at least 30 feet from home (84 to 52%, respectively. See table 12).
- Less than one-half indicated that they had placed fuel containers at least 30 feet from and uphill of all structures, pruned branches within 75 feet of their residence to a height of 10 feet above the ground, or cut down trees under electrical lines (47 to 38%, respectively).

3.6.4 Reported Defensible Space Behavioral Intentions

- More than one-half of respondents indicated that they were likely to engage in each defensible space behavior in the next year (Table 13).
- Respondents were most likely to mow grasses/weeds to less than 6 inches (91%); and remove dead limbs, leaves, and other debris within 75 feet of their residence (89%).
- Although still a majority, respondents were least likely to cut down trees under electrical lines (58%); reduce the density of trees within 75 feet of their residence (59%); or prune the branches within 75 feet of their residence to a height of 10 feet above the ground (59%).

3.7 Firewise Construction Beliefs and Actions

Similar to the defensible space section, the questionnaire included three questions about firewise construction in general and three sets of questions on 10 specific firewise construction recommendations.

3.7.1 General Beliefs and Attitudes about Firewise Construction

- Respondents were moderately (41%) to extremely (35%) familiar with firewise construction (Table 14).
- Ninety-three percent indicated that they believed firewise construction modifications would make their home moderately (30%) to extremely (63%) safer in the event of a wildland fire.
- Fifty-five percent of respondents believed that firewise construction modifications would make their home look better. Two-fifths (42%), however, said firewise construction modifications would neither make their home look better or worse.

3.7.2 Specific Beliefs about Perceived Effectiveness of Firewise Construction Recommendations

- Seventy-four percent or more of the respondents believed that the firewise construction activities were moderately to extremely effective (Table 15).
- Installing a fire resistant roof (95%); siding (94%); or decking (91%) ranked highest in perceived effectiveness.

3.7.3 Reported Firewise Construction Behaviors

- Most respondents indicated that their windows and sliding glass doors are made of multi-paned glass (91%); that their roof (70%) and siding (51%) were constructed using appropriate firewise materials; that they had installed screens over roof vents (63%); and that they had installed a chimney screen or spark arrestor (70%) (Table 16).
- Less than one-half indicated that they had installed fire resistant decking (28%); that areas under their decks or balconies were enclosed with appropriate materials and kept free of vegetation (30%); they had enclosed roof eaves with fire resistant soffits (41%); or had installed an emergency water supply (46%).

3.7.4 Reported Firewise Construction Behavioral Intentions

- Many people reported that they had already done some of the firewise construction actions. (Table 16, section 3.7.3 above). They already have multi-pane windows, a fire resistant roof, etc. Table 17 reports on only those who have not indicated they have completed the various firewise construction actions, i.e., 9% (multi-pane windows) to 72% (fire resistant decking) of the respondents.
- Of those who had not already done so, over half of the respondents (76 to 55%) indicated that were "not at all likely" to do <u>any</u> of the recommended firewise construction or modification activities in the next year, with the exception of installing a house number (31%) (Table 17).
- Over 70% of those who had not already done so did not plan on installing a fire resistant roof (71%), fire resistant siding (76%), fire resistant decking (70%), or enclosing roof eaves (73%) (Table 17).

3.8 Barriers to Implementing Firewise Recommendations

The survey listed a set of 21 potential barriers to firewise actions. Respondents were asked how much of a barrier each item was in deciding whether to take action to reduce the risk of loss due to wildland fire on their property.

- Cost was the primary barrier for doing defensible space and firewise construction activities (Table 18). Over two-thirds (69%) of respondents indicated that cost of firewise construction activities was a moderate to extreme barrier. Half of the respondents said cost of doing defensible space activities was a moderate to extreme barrier.
- Time (52%), remodeling requirements (42%), and amount of work it takes to make the recommended changes (40%) were also moderate to extreme barriers for 40% or more of the respondents.

3.9 Predicting Behavioral Intentions

As noted in the introduction, intentions to perform defensible space activities and / or firewise construction recommendations have been shown to be influenced by three categories of predictors (Absher et al., 2009): (a) socio-demographics (e.g., age, sex, education, income), (b) situational variables (e.g., distance from a forest, the hazard rating of the property, membership in a homeowners association), and (c) psychological indicators (e.g., perceived risks and barriers). For example, individuals with more income have more personal resources to adopt some homeowner wildland fire mitigation strategies (e.g., firewise construction). Similarly, proximity of a home to a forest is likely to enhance the homeowners' general awareness of the potential dangers associated with wildland fires and their willingness to accept mitigation efforts.

In this section we use multiple regression analysis to test the strength and direction of association between selected socio-demographic, situational, and psychological variables and the likelihood that an individual will participate in mitigation activities in the future. *These analyses include only those individuals who have not performed a particular action previously*. Consistent with earlier work elsewhere, it is expected that psychological variables will be better predictors of behavioral intention than the more general socio-demographic and situational variables. To this we have added new measures of residents' sense of community and perception of barriers to the models.

Tables 19 and 20 summarize the results of these analyses. Variables were entered into the equations in groups. For example, the first group included only the socio-demographic indicators. Next the situational and psychological predictors were added, respectively. The psychological variables are further divided into three sections: beliefs, sense of community and barriers. Tables 19 and 20 first present the beliefs subset as a third block, then the fourth and fifth (bottom two) sections report the sense of community and barriers measures. Results for each of these five groups of predictors is reported separately in the column labeled "Subset Model." Next to it is an overall regression, which included all 5 sets of independent variables simultaneously. It is reported in the column "Full Model." This two-column presentation is repeated for each of the 16 firewise activities: defensible space actions in Table 19 and firewise construction actions in Table 20.

It is important to note that in some cases, a variable could be statistically significant ($p < .05$) in its respective subset block, but not in the subsequent combined analysis, or vice versa. These variables are not noted separately in the tables and simply have no entry if they are not a significant explanatory variable in that particular regression analysis. If a variable does not appear at all in either table 19 or 20 it was not statistically significant in <u>any</u> analysis. For instance, the "Known" community index (Table 7) does not predict any firewise action and is not included in either Table 19 or 20, whereas the other three sense of community indices

(Perspective, Action and Home) do predict a firewise action at some point, and thus are included in the tables. Also note the explanatory power (R^2) for most of these subset regressions, while statistically significant, is weak to moderate (0% to 12% of the variance explained). The psychological belief/risk variables were always stronger predictors than the other subsets of variables for any given action (R^2 range from 7% to 33%). The overall (Full Model) model R^2 results are from 7% to 40%.

3.9.1 Defensible Space

- Sex and income were the only significant socio-demographic variables in the prediction of defensible space actions (Table 19). Men were more likely than women to stack firewood or to place fuel containers 30 feet away from and uphill of all structures. Income was a significant predictor for removing dead limbs, leaves, and other debris within 75 feet of the residence, with respondents in the under $50,000 income categories more likely to remove dead limbs or debris.
- Each of the five situational variables was significant in predicting at least one of the behavioral intentions. Respondents who were not a member in an HOA indicated that they were more likely to cut down trees under electrical lines than individuals who were HOA members. Second, participation in community activities was always significant when initially added to the regression model (except for stacking firewood). However, when combined with the psychological variables, this situational predictor was only significant for reducing density of trees within 75 feet of the residence.
- As predicted, the psychological variables more often influenced the intention to perform defensible space activities than either the socio-demographic, situational, community or barrier variables.
    - Beliefs about legal considerations was significant for 4 of the 8 regression models when entered initially. In the final model, it was significant for stacking firewood, pruning branches to 10 feet above the ground, and placing fuel containers 30 ft. from structures.
    - The general belief regarding aesthetic impact of defensible space was significant for 4 of the 8 initial regression models. In the final model, it remained significant for three of these four: trim branches over the roof, remove flammable vegetation within 15 feet, and pruning branches to 10 feet above the ground.
    - Perceived effectiveness was a significant predictor of behavioral intention for all defensible space recommendations, both as a separate subset entry and as an overall model predictor, and consistently had a strong influence.
    - Perceived risk was only significant for pruning branches to 10 feet above the ground model.
    - Significant barriers were reported for time, aesthetics, decreasing the natural look of the property, priorities, and lack of equipment. In the full model time was a significant barrier for cutting down trees under electrical lines. Initially (subset models) aesthetics was a barrier for 4 of the 8 activities with two remaining significant in the full model. Priorities helped to explain removing dead limbs and debris, and placing fuel containers apart from structures in the full model regressions.

- Three of the four Sense of Community variables came into play for defensible space actions with Action and Home significant in the full model. For example, individuals who felt they had more influence in the community (Action) were more likely to indicate that they would cut down trees under electrical lines in the future. In addition, people who felt attached to the community (Home) were more likely to cut down trees under electrical lines.

Taken together, this collection of socio-demographic, situational, and psychological variables explained between 23% (removing flammable vegetation) and 40% (pruning branches to 10 feet above the ground, cutting down trees under electrical lines) of the variance in intentions to adopt defensible space activities in the future among those who had not already done that activity.

3.9.2 Firewise Construction

- Age and income were significant socio-demographic variables for intentions to install a fire resistant roof (Table 20). Older individuals and individuals in the $75,000-$99,999 income category reported being more likely to install a fire resistant roof than other individuals, although income drops off as a predictor in the full model.
- Three situational variables were sometimes significant. First, respondents who were not a member in an HOA indicated that they were more likely to install a fire resistant roof, install screens over roof vents, and enclose roof eaves with soffits than individuals who were HOA members. Second, individuals whose property had a higher hazard rating were more willing to install a chimney screen or spark arrestor, and to enclose decks or balconies with fire-resistant materials. Third, total participation in community activities was a significant predictor of intention to install screens over roof vents.
- Among the psychological variables:
  - Beliefs regarding responsibility and legal considerations were sometimes significant. Legal considerations were significant for installing a chimney screen or spark arrestor and for enclosing decks or balconies. Responsibility was significant for installing screens over roof vents, and for enclosing roof eaves with soffits.
  - Familiarity with firewise construction was significant for installing a fire-resistant roof and screens over roof vents. The general belief regarding aesthetic impact of firewise construction was significant for 5 of the 10 construction modifications.
  - Perceived effectiveness was a significant predictor for 7 of the 8 construction modification models. It was not significant for installing siding. Perceived effectiveness was consistently one of the strongest predictors.
  - Perceived risk was only significant for enclosing roof eaves with soffits in either the subset or full models.
  - Significant barriers were found for remodeling's link to fire resistant siding and enclosing roof eaves, and priorities predicted a lack of emergency water supply.
  - Community variables came into play for four of the eight activities initially, with only enclosing roof eaves with soffits remaining in the full model regression. Individuals who felt they had more influence in the community were more likely to indicate that they would do this modification.

Overall, this collection of predictor variables only explained 7% (fire resistant decking) to 21% (installing screens over roof vents) of the variance.

4. MANAGEMENT IMPLICATIONS

- **Messaging is setting dependent**

  Individuals and communities will likely respond differently to firewise messages. Such differences are driven by socio-demographic, situational, and psychological influences. There does not seem to be a simple pattern, so it is important that land managers recognize a diversity of views and tailor messages to specific groups of individuals.

- **Firewise construction issues are more difficult than defensible space**

  Although saving homes is a dominant concern of firefighters and residents alike, our results show that firewise construction goals are less likely to be achieved than defensible space actions. Local construction codes and insurance may influence these actions, as might the cohesiveness and styles of communication among residents. This places emphasis on local partnerships and leadership in addition to communicating the effectiveness of firewise construction activities. It also suggests that some community programs or policies, such as retrofitting assistance or building codes, might play a significant role in actions that are expensive or more technically involved.

- **Community context is important**

  A sense of community can activate norms regarding acceptable firewise behaviors. Once activated a community is more likely to behave in a consistent way. Norms, however, are not created instantly. Because the Action index seems the most promising, community leaders might seek to establish short terms goals for encouraging firewise behavior and not be discouraged easily as it will likely take time to build an effective firewise program. In the short term, small but meaningful changes (e.g., enclosing soffits) are good and will likely lead to long term resiliency and less loss from wildland fires.

- **Communicating about the effectiveness of firewise actions is important**

  The responsibilities of residents and the need to take firewise actions are, arguably, a critical part of loss mitigation and effective firefighting. Communication efforts might benefit from an enhanced focus on which firewise actions will be effective in a given community or neighborhood, and the types of messages that might be most effective. However, it is important to maintain realistic expectations about potential losses from wildfire, especially among residents.

5. RELATIONSHIP TO OTHER RECENT FINDINGS AND ONGOING WORK ON THIS TOPIC

Our data are based on respondents reported behaviors. Ongoing work is examining the relationship between reported behaviors and actual behavior through a professional defensible space assessment. Examination of residents' actual behavior, in concert with

stated intentions or other social factors, will highlight whether or not the reported actions were sufficient to be effective.

Ancillary analysis of the data reinforce previous work and suggests that residential loss mitigation is complicated, but working with what is known and preferred in a given setting, and working with communities to enact some defensible behavior may stimulate participation in other related activities.

6. FUTURE WORK NEEDED

This study included general and specific beliefs about firewise actions. We recommend continuing to differentiate these in the future. Additional research is needed in the following areas:

6.1 Behavior

- In this study we looked at a number of suggested firewise actions. However, people could have done these activities for reasons unrelated to wildland fire mitigation. Future studies need to clarify the extent to which people are doing these activities for wildfire mitigation reasons.
- There is a need to better understand the effectiveness of Community Wildfire Protection Plans and their relationship to both individual and community-based firewise behaviors. In particular we think that a better understanding of the precursors (e.g., psychological, social, economic, institutional) will make for more robust firewise programs.

6.2 Barriers

- In this study we used terminology such as "barriers." Future work may want to clarify what is meant by that terminology. It is both a theoretical (scientific) issue and a practical one that will be useful in communications.
- Future research could also focus on teasing out the nuances between barriers and incentives or motivations for doing firewise activities. For example, cost may be a barrier for removing large amounts of vegetation but community chipping programs may help overcome that barrier.
- Future studies could consider the role of insurance companies and local institutions in terms of encouraging or discouraging defensible space activities. The interplay among regulatory and policy setting agencies, local groups and the business communities will be important to achieving firewise goals. Fiscal and social incentives to participate may be equally helpful.

6.3 Sense of Community

- This study was one of the first investigations to measure sense of community relative to wildland fire issues. More work in this area, however, is needed to build on our initial findings, refine the measurements, and create better tools and outreach programs. Further work that elucidates the relationships among both psychological and sociological influences will improve our understanding of the role that various forms of social capital (e.g., CWPPs, HOAs, Firewise Communities) social organization can, or does, have in a given community.

Working together across social and institutional levels will likely be more productive and improve effective communications at a local level, but has been little studied.

6.4 Consideration of other types of communities, risks, and vegetation types.

- This study was limited to selected areas in Colorado. The areas we studied represent a spectrum of different types of communities, risks, and vegetation types. Nonetheless, areas with different types of socio-cultural features exist across Colorado, the United States, and other countries. Replicating this study in other settings and states would allow for a more robust, multi-level analysis to tease out contextual influences on barriers and incentives to adopting defensible space.
- Wildfires are not just limited to forested or mountainous areas of Colorado or the western US. Wildfires also occur on other, different landscape types, notably prairies, wooded lands and open landscapes where high winds, high temperatures, or drought may create dry, vulnerable conditions. This occurs in many other states such as Texas, Oklahoma, Minnesota and Florida. As Colorado continues to develop and population densities grow, the danger of a catastrophic wildfire is increasing in these areas. Future research could better address firewise behavior and barriers in other regions of the state and across the U.S.

7. DELIVERABLES

7.1 Deliverables crosswalk table

Deliverable	Description	Status
Progress reports	Description of progress towards objectives, timeline of project, and findings to date.	Complete
Community profiles	Community profiles with respect to fire history, homeowner preparedness and previous attitudes and behaviors.	Partially done; data limited
Guides	Practical guides to reducing wildland fire losses for use by collaborators and managers.	In progress, with CSFS
Site assessments	Site assessments conducted by a Colorado State Forest Service forester.	In progress as addition to original tasks
Ph.D. Dissertation	Katie M. Lyon, Colorado State University	In progress
Conference presentations	Presentations of results at scientific conferences.	Completed 4, more forthcoming
Journal articles	Peer reviewed journal articles.	Forthcoming
Final report	Summary of research design and findings.	Complete

7.2 Conference presentations

Absher, J. D., Vaske, J. J., & Lyon, K. M. (2013). The role of community in wildland fire risk reduction. Paper presented to International Symposium on Society and Resource Management. Estes Park, Colorado, June 4-8.

Lyon, K. M., Vaske, J. J., & Absher, J. D. (2012). Understanding barriers to firewise behaviors. Paper presented at the 18th International Symposium on Society and Resource Management. Edmonton, Alberta, Canada. June 17-21.

Absher, J. D., Lyon, K. M., & Vaske, J. J. (2012). Incorporating measures of community in wildland fire preparedness education. Paper presented at the International Association of Wildland Fire, 3rd Human Dimensions of Wildland Fire Conference. Seattle, Washington, April 17-19.

Vaske, J. J., Absher, J. D., & Lyon, K. M. (2012). Wildland fire and community preparedness education. Paper presented at the 9th Biennial Conference on University Education in Natural Resources Conference. Fort Collins, CO. March 22-24.

Lyon, K. M., Absher, J. D., Vaske, J. J., Peterson, C., & Mason, L. (2011). Increasing defensible space practices among homeowners. Presentation to Backyards and Beyond Conference. Denver CO: National Fire Protection Association. October 27-29.

8. LITERATURE CITED

Absher, J. D., Vaske, J. J., & Shelby, L. B. (2009). *Residents' responses to wildland fire programs: A review of cognitive studies*. Gen. Tech. Rep. PSW-GTR-223. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station.

Bueche, D., & Foley, T. (2012). FireWise construction: Site design & building materials. Fort Collins: Colorado State Forest Service. http://www.csfs.colostate.edu/pdfs/firewise-construction2012.pdf

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). *Internet, mail, and mixed-mode surveys: The tailored design method* (3rd ed.). Hoboken, NJ: Wiley.

McMillan, D. W., & Chavis, D. M. (1986). Sense of community: A definition and theory. *Journal of Community Psychology, 14*, 6–23. doi: 10.1002/1520-6629(198601)14:1<6::AID-JCOP2290140103>3.0.CO;2-I

APPENDIX A. TABLES

Table 1. Demographic characteristics of respondents

Demographics	%[1]
Sex	
Male	70
Female	30
Age	
20 – 29	1
30 – 39	6
40 – 49	10
50 – 59	28
60 – 69	34
70+	23
Mean age = 60.38	
Education	
Less than high school diploma	2
High school or GED	13
Some college	29
4 year college degree (bachelors)	32
Advanced degree beyond 4 year degree	23
Mean education = 15.56 years	
Income	
Less than $24,999	12
$25,000 to $49,999	20
$50,000 to $74,999	26
$75,000 to $99,999	19
More than $100,000	23

[1] May not add to 100% due to rounding error.

Table 2. General description of respondent's property

	Yes %
Do you own this property?	100
Is this your primary residence?	97
Do you live at this residence year round?	94
Were you involved in the design of this residence (either the original design or renovations)?	54
Which best describes this residence?	
A single-family house - detached from any other house	93
A manufactured home, mobile home, or trailer	7
How long have you lived at this residence?	
≤ 5 years	21
6 to 10 years	22
11 to 20 years	33
21 to 79 years	23
Mean years = 15.4	
What is the size of your lot in acres?	
< 1 acre	17
1 to 3 acres	24
3 to 10 acres	23
10 to 50 acres	25
> 50 acres	10
Mean = 53.3 acres	
Range = .1 to 5,000 acres	
Is this residence located in a subdivision?	48
Do you belong to a homeowners or landowners association?	35
About how far is this residence from a forested area?	
I live within a forested area	42
< 1 mile	16
1 to 5 miles	12
5 to 10 miles	10
10 to 20 miles	10
More than 20 miles	10

Table 3. Vegetation, slope and hazard rating of the property

	%
Which of the following best describes the vegetation on this property?	
Bare rock or gravel	2
Irrigated lawn	15
Grass, shrub, less than 2 feet tall, no trees	5
Grass, shrub, less than 4 feet; widely dispersed trees	23
Thick, tall grass	1
Dense mature shrubs, some trees	5
Many trees, touching; some grass and brush	24
Dense evergreen trees with grass and shrubs	12
Other	12
What is the approximate slope of the land immediately surrounding this residence?	
Flat	34
Gently sloped	39
Moderately sloped	22
Steeply sloped	5
Hazard rating [1]	
No hazard	11
Low hazard	24
Medium hazard	38
High hazard	26
Very high hazard	1

1. The hazard rating is the sum of the slope and vegetation scores. This short evaluation is based on the Wildland Home Fire Risk Meter developed by the National Wildfire Coordinating Group.

Table 4. Participant experiences with wildland fire

	Yes %
Personally	
…experienced discomfort from the smoke of a wildland fire	64
…had my work/job/livelihood affected by a wildland fire	22
…received a reverse 911 call to prepare to evacuate	15
…been evacuated from my house due to a wildland fire	12
…had other personal property destroyed or damaged due to a wildland fire	8
…residence damaged or lost due to a wildland fire	5
…been injured as a result of a wildland fire	3
Know someone	
…who has been evacuated from her/his residence due to a wildland fire	52
…whose residence or property has been damaged or lost due to a wildland fire	40
…whose work/job/livelihood was affected by a wildland fire	40
…who has been injured as a result of a wildland fire	23

Table 5. Current participation in community activities

Do you do this now?	Yes %
Work with your neighbors to reduce the risk of wildland fire on your property or that of your neighbors	26
Obtain additional information from a land management, community group, or firefighting agency on how to prepare for wildland fire	24
Consult with public officials or foresters	23
Participate in wildfire-related events (e.g., debris collection day)	20
Volunteer within the community to help clear and remove combustible material (e.g., brush, litter)	18
Attend community-based meetings related to wildland fire	18
Attend a public meeting about defensible space	15
Participate in a Community Wildfire Protection Plan	14
Participate in a neighborhood or community effort to thin overly dense forest areas	13
Help organize community education programs related to wildland fire	8
Participate in a FireWise Council or similar organization	7

Table 6. Sum of the community activities

# of activities currently do	%
0	52
1	13
2	9
3	5
4	4
5	3
6	2
7	3
8	2
9	1
10	1
11	2

Table 7. Sense of Community Index

	Mean	Disagree %	Neutral %	Agree %	Cronbach's alpha
Home					.87
I feel at home in this neighborhood	6.01	5	9	87	
This community is a good place for me to live	5.86	5	11	84	
My community is a special place to live	5.54	9	16	75	
Known					.91
I recognize most of the people who live in my neighborhood	5.46	14	6	80	
Most of my neighbors know me	5.35	15	8	77	
Shared perspectives					.90
People in my neighborhood generally get along with each other	5.45	12	11	77	
People in my neighborhood share the same values	4.70	21	23	56	
My neighbors and I want the same things from this community	4.73	17	27	55	
I feel a strong sense of community with my neighbors	4.58	25	22	53	
Action					.83
If there is a problem in my neighborhood, people who live here get it solved	4.90	17	22	61	
I care about what my neighbors think about my actions	4.65	23	18	59	
I have an influence over what this community is like	4.37	23	28	49	
I often take an active role in solving neighborhood problems	4.37	24	28	48	

1. Variables originally coded on 7-point scales where 1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = neutral, 5 = slightly agree, 6 = moderately agree, and 7 = strongly agree.

Table 8. Beliefs about fire protection and firewise activities

Belief Statements [1]	*Mean*	Disagree %	Neutral %	Agree %	Cronbach's alpha
Responsibility					.70
Homeowners should be personally responsible for protecting their homes from fire (e.g., creating defensible space).	6.33	3	4	93	
Homeowners are the most responsible for protecting their homes, near a forest, from wildfire.	6.13	6	5	89	
The community fire department is the most responsible for protecting homes, built near a forest, from wildfire. [2]	3.20	55	20	25	
Land management agencies are most responsible for protecting homes, built near a forest, from fire. [2]	3.04	57	22	21	
Legal Considerations					.78
Laws should prohibit people from building homes near forests where they can be burned by fires.	2.59	68	15	17	
People should be allowed to build homes where they want, even if it is in a high wildfire zone. [2]	4.47	32	16	52	
Homeowners near a forest should be required by law to take steps necessary to protect their homes from wildfire.	4.29	34	14	52	
New home construction should be required by law to use fire resistant materials.	4.66	25	15	60	
Creating defensible space around homes should be voluntary. [2]	4.49	33	12	55	
Using fire resistant materials in construction should be voluntary. [2]	4.38	35	14	51	

1. Variables originally coded on 7-point scales where 1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = neutral, 5 = slightly agree, 6 = moderately agree, and 7 = strongly agree.
2. Items were reverse coded.

Table 9. Perceptions of wildland fire risk

Likelihood of fire [1,2]	*Mean*	Not at all Likely %	Slightly Likely %	Moderately Likely %	Extremely Likely %
Your own residence/property	2.91	27	39	26	8
The community in which you live	3.70	16	33	32	19

1. The specific question asked: How likely do you think it is that a wildland fire will occur at each of the following in the near future?
2. Variables originally coded on 7-point scales where 1 = not at all likely, 3 = slightly likely, 5 = moderately likely, and 7 = extremely likely.

Table 10. General beliefs and attitudes about defensible space

	%
How familiar are you with defensible space activities?	
Not at all familiar	4
Slightly familiar	11
Moderately familiar	39
Extremely familiar	46
Do you believe defensible space activities make your home / property *safer* in the event of a wildland fire?	
Makes no difference	2
Slightly safer	3
Moderately safer	23
Extremely safer	71
Do you believe defensible space activities make your home / property *look better or worse*?	
Worse	11
Neither	20
Better	69

Variables originally coded on 7-point scales

Table 11. Specific beliefs about the perceived effectiveness of defensible space activities

	Mean [1]	Moderately to Extremely Effective [2] %
Removing dead limbs, leaves, and other debris within 75 feet of your residence	6.24	93
Removing flammable vegetation from within 15 feet of all structures	6.17	92
Reducing the density of trees within 75 feet of your residence	6.11	91
Placing fuel containers at least 30 feet from and uphill of all structures	6.10	89
Trimming the branches that extend over your roof	6.06	91
Mowing grasses/weeds to less than 6 inches	6.02	89
Cutting down trees under electrical lines	5.97	86
Pruning branches within 75 feet of your residence to a height of 10 feet above the ground	5.80	85
Stacking firewood at least 30 feet from and uphill of all structures	5.85	84
Cleaning roof surfaces/gutters to avoid accumulation of leaves	5.43	79

1. Variables coded on 7-point scales where 1 = not at all effective, 3 = slightly effective, 5 = moderately effective, and 7 = extremely effective.
2. The percents combine response categories 5 through 7.

Table 12. Reported defensible space behaviors [1]

Reported defensible space behaviors	Yes %
Mowed grasses/weeds to less than 6 inches	84
Removed dead limbs, leaves, and other debris within 75 feet of your residence	79
Trimmed branches that extend over your roof	70
Cleaned roof surfaces/gutters to avoid accumulation of leaves at least twice a year	66
Removed all flammable vegetation from within 15 feet of all structures	54
Reduced the density of trees within 75 feet of your residence	53
Stacked firewood at least 30 feet from and uphill of all structures	52
Placed fuel containers at least 30 feet from and uphill of all structures	47
Pruned branches within 75 feet of your residence to a height of 10 feet above the ground	44
Cut down trees under electrical lines	38

1. The question asked: In the last 5 years, have you done any of the following defensible space activities at this residence / property?

Table 13. Reported likelihood of performing defensible space activities next year [1]

	Mean [1]	Moderately to Extremely Likely [2] %
Mow grasses/weeds to less than 6 inches	6.29	91
Remove dead limbs, leaves, and other debris within 75 feet of your residence	6.08	89
Clean roof surfaces/gutters of leaves	5.88	86
Trim the branches that extend over your roof	5.58	81
Remove flammable vegetation from within 15 feet of structures	5.56	79
Place fuel containers at least 30 feet from and uphill of all structures	5.40	74
Stack firewood at least 30 feet from and uphill of all structures	5.37	74
Cut down trees under electrical lines	4.61	58
Reduce the density of trees within 75 feet of your residence	4.56	59
Prune the branches within 75 feet of your residence to a height of 10 feet above the ground	4.56	59

1. The specific question asked: How likely are you to do each of the following defensible space activities in the next year?
2. Variables coded on 7-point scales where 1 = not at all likely, 3 = slightly likely, 5 = moderately likely, and 7 = extremely likely. For each variable, there was also a "Does Not Apply" response category.
3. The percents combine response categories 5 through 7.

Table 14. General beliefs and attitudes about firewise construction

	%
How familiar are you with firewise construction?	
Not at all familiar	7
Slightly familiar	17
Moderately familiar	41
Extremely familiar	35
Do you believe firewise construction modifications make your home *safer* in the event of a wildland fire?	
Makes no difference	2
Slightly safer	5
Moderately safer	30
Extremely safer	63
Do you believe firewise construction modifications make your home *look better or worse*?	
Worse	3
Neither	42
Better	55

Variables originally coded on 7-point scales

Table 15. Specific beliefs about the perceived effectiveness of firewise construction modifications

	Mean [1]	Moderately to Extremely Effective [2]
Fire resistant roof	6.36	95%
Fire resistant siding on house or other buildings	6.18	94%
Fire resistant decking	6.00	91%
Chimney screen or spark arrestor	6.07	90%
Emergency water supply	6.04	89%
House number in a clearly visible place	5.88	85%
Enclosing roof eaves with fire resistant soffits	5.61	80%
Screens over roof vents	5.50	78%
Multi-pane glass windows or sliding glass doors	5.43	78%
Enclosing undersides of decks and balconies	5.32	74%

1. Variables coded on 7-point scales where 1 = not at all effective, 3 = slightly effective, 5 = moderately effective, and 7 = extremely effective.
2. The percents combine response categories 5 through 7.

Table 16. Reported firewise construction modifications [1]

	Yes [2] %
Install multi-pane glass windows or sliding glass doors	91
Install house number in a clearly visible place	85
Install a fire resistant roof	70
Install a chimney screen or spark arrestor	70
Install screens over roof vents	63
Install fire resistant siding on house or other buildings	51
Install an emergency water supply	46
Enclose roof eaves with fire resistant soffits	41
Enclose undersides of decks and balconies	30
Install fire resistant decking	28

1. The question asked: Does this residence have any of the following firewise construction modifications?
2. The original response categories were: (1) Yes, completed by previous owner, (2) Yes, I completed this myself, (3) No, (4) Does not apply. For purposes of this analysis, the two "yes" responses were combined.

Table 17. Reported likelihood of performing firewise construction modifications [1]

	n	*Mean* [2]	Not at all Likely %	Slightly Likely %	Moderately Likely %	Extremely Likely %
Install a fire resistant roof	205	1.47	71	17	8	5
Install fire resistant siding on house or other buildings	324	1.37	76	16	5	4
Install fire resistant decking	384	1.46	70	17	9	4
Install a chimney screen or spark arrestor	154	1.66	64	16	12	9
Install screens over roof vents	204	1.66	64	15	14	8
Enclose roof eaves with fire resistant soffits	338	1.42	73	17	6	4
Install multi-pane glass windows or sliding glass doors	56	1.82	55	21	9	14
Enclose undersides of decks / balconies	349	1.54	67	17	11	5
Install an emergency water supply	338	1.58	64	21	9	2
Install house number in a clearly visible place	102	2.59	31	14	20	35

1. The specific question asked: How likely are you to do each of the following firewise construction modifications at this residence in the next year?
2. Variables coded on 7-point scales where 1 = not at all likely, 3 = slightly likely, 5 = moderately likely, and 7 = extremely likely. For each variable, there was also a "Does Not Apply" response category.

Table 18. Barriers to implementing defensible space activities and firewise construction modifications

Barriers	*Mean* [1]	Not a Barrier %	Slight Barrier %	Moderate Barrier %	Extreme Barrier %
Cost of firewise construction modifications	4.53	18	13	31	38
Cost of doing defensible space activities	3.61	31	19	29	21
Time it takes to implement actions	3.61	24	24	34	18
Requires remodeling my home	3.23	49	9	14	28
Amount of work it would take to make the recommended changes	3.13	37	24	24	16
Physical difficulty of doing the work	2.89	44	22	19	15
Availability of expert advice	2.61	48	24	17	11
Neighbors do not do defensible space	2.60	54	17	14	15
Personal priorities	2.58	50	20	21	10
Lack of knowledge about firewise construction	2.47	47	28	17	7
Lack of knowledge about defensible space	2.40	50	26	17	7
Would decrease my privacy	2.36	59	15	15	11
Lack of equipment (e.g., chain saw)	2.25	63	16	11	10
Would decrease the natural look of my property	2.17	61	18	13	8
Disagreement with recommended actions	2.15	57	22	17	4
Aesthetic impact on my property	2.12	61	20	12	7
The terrain on my property	1.95	68	15	10	6
Nowhere to dispose of plant/tree material	1.84	73	13	7	7
Lack of authority to make changes to property	1.61	79	10	7	4
Not enough space on property to make recommended defensible space changes	1.62	78	11	6	4
Not at this residence enough to worry	1.56	80	9	8	3

1. The specific question asked: When deciding whether to take action to reduce the risk of loss due to wildland fire on your property, how much of a barrier is each of the following items?

2. Variables coded on 7-point scales where 1 = not a barrier, 3 = slight barrier, 5 = moderate barrier, and 7 = extreme barrier.

Table 19a. Predicting intention to perform defensible space activities

Model	Trim branches that extend over roof		Removed flammable vegetation within 15 ft.		Reduced density of trees within 75 ft.		Pruned branches to 10 ft. above ground	
	Subset Model	Full Model	Subset Model	Full Model	Subset Model	Full Model	Subset Model	Full Model
Socio-demographic								
Sex								
Income *								
< $24,999								
$25,000-$49,999								
$50,000-$74,999								
$75,000-$99,999								
Subset Model R^2	0%		0%		0%		0%	
Situational								
Homeowners Association			-.14					
Subdivision								
Total activities	.27		.22		.16	.18	.14	
Design of residence				.12				
Hazard rating								
Subset Model R^2	7%		5%		3%		2%	
Psychological								
Beliefs								
Basic – Legal					.14		.16	.13
Basic – Responsibility						-.16		-.13
General – Aesthetics	.27	.27	.31	.32	.14		.25	.15
General – Safety	-.23	-.23						
Specific - Effectiveness	.51	.51	.27	.27	.36	.34	.35	.36
Perceived Risk							.15	.16
Subset Model R^2	33%		22%		22%		33%	
Sense of Community								
Shared perspective					.19			
Action								
Home			.19				.18	
Subset Model R^2	0%		4%		4%		3%	
Barriers								
Time								
Aesthetics	-.23		-.15		-.34	-.30	-.36	-.27
Decrease natural look								
Priorities			-.18					
Lack of equipment								
Subset Model R^2	6%		8%		12%		13%	
Full Model R^2		33%		23%		29%		40%

Notes. Subset Models contain only variables in each grouping, while all variables were entered in the Full Model. All R^2 $p < .001$. See page 10-11 for an explanation of variable coding and excluded variables. Standardized B ($p < .05$).

* The reference group is "More than $100,000."

Table 19b. Predicting intention to perform defensible space activities

Model	Cut down trees under electrical lines		Remove dead limbs, leaves, debris		Stack firewood 30 ft. from / uphill of all structures		Place fuel containers 30 ft. from / uphill of all structures	
	Subset Model	Full Model	Subset Model	Full Model	Subset Model	Full Model	Subset Model	Full Model
Socio-demographic								
Sex					-.21	-.24		-.15
Income *								
< $24,999				-.20				
$25,000-$49,999			.24					
$50,000-$74,999								
$75,000-$99,999								
Subset Model R^2	0%		6%		5%		0%	
Situational								
Home Owners Association	-.17	-.15						
Subdivision								-.12
Total activities	.24		.23				.15	
Design of residence								
Hazard rating							-.21	
Subset Model R^2	7%		5%		0%		5%	
Psychological								
Beliefs								
Basic – Legal	.14					.14	.18	.18
Basic – Responsibility							-.12	-.17
General – Aesthetics								
General – Safety								
Specific - Effectiveness	.47	.44	.42	.38	.47	.45	.49	.49
Perceived Risk								
Subset Model R^2	26%		17%		22%		30%	
Sense of Community								
Shared perspective							.14	
Action	.42	.43						
Home	.22	.30						
Subset Model R^2	12%		0%		0%		2%	
Barriers								
Time		-.16						
Aesthetics								
Decrease natural look					-.17			
Priorities			-.32	-.33			-.27	-.18
Lack of equipment		.20						
Subset Model R^2	0%		1%		3%		7%	
Full Model R^2		40%		30%		29%		38%

Notes. Subset Models contain only variables in each grouping, while all variables were entered in the Full Model. All R^2 $p < .001$. See page 10-11 for an explanation of variable coding and excluded variables. Standardized B ($p < .05$).

* The reference group is "More than $100,000."

Table 20a. Predicting intention to perform firewise construction modifications activities

Model	Fire resistant roof		Fire resistant siding		Fire resistant decking		Chimney screen/ spark arrestor	
	Subset Model	Full Model	Subset Model	Full Model	Subset Model	Full Model	Subset Model	Full Model
Socio-demographic								
Age	-.16	-.17						
Income *								
< $24,999								
$25,000-$49,999								
$50,000-$74,999								
$75,000-$99,999	-.18							
Subset Model R^2	5%		0%		0%		0%	
Situational								
Homeowners Association	-.16	-.19						
Total activities								
Hazard							.12	.14
Subset Model R^2	3%		0%		0%		2%	
Psychological								
Beliefs								
Basic – Legal								.12
Basic – Responsibility								
General – Familiarity	.19	.22						
General – Aesthetics			.28	.28	.21	.21		
General – Safety								
Specific - Effectiveness	.21	.22			.11	.11	.27	.26
Perceived Risk								
Subset Model R^2	9%		8%		7%		7%	
Sense of Community								
Shared perspective								
Action							.11	
Home								
Subset Model R^2	0%		0%		0%		1%	
Barriers								
Remodel			-.14	-.14				
Priorities								
Subset Model R^2	0%		2%		0%		0%	
Full Model R^2		15%		10%		7%		10%

Notes. Subset Models contain only variables in each grouping, while all variables were entered in the Full Model. All R^2 $p < .001$. See page 10-11 for an explanation of variable coding and excluded variables. Standardized B ($p < .05$).

* The reference group is "More than $100,000."

Table 20b. Predicting intention to perform firewise construction modifications

Model	Screens over roof vents		Enclosed roof eaves w/ soffits		Enclosed decks or balconies		Emergency water supply	
	Subset Model	Full Model	Subset Model	Full Model	Subset Model	Full Model	Subset Model	Full Model
Socio-demographic								
Age								
Income *								
< $24,999								
$25,000-$49,999								
$50,000-$74,999								
$75,000-$99,999								
Subset Model R^2	0%		0%		0%		0%	
Situational								
Homeowners Association	-.22	-.22		-.15				
Total Activities	.27	.18						
Hazard					.12	.14		
Subset Model R^2	8%		0%		2%		0%	
Psychological								
Beliefs								
Basic – Legal						.12		
Basic – Responsibility	-.20		-.21	-.24				
General – Familiarity	.20							
General – Aesthetics		.17	.12				.13	.13
General – Safety								
Specific - Effectiveness	.33	.30	.16	.18	.27	.26	.24	.24
Perceived Risk			.14	.19				
Subset Model R^2	20%		10%		7%		9%	
Sense of Community								
Shared perspective								
Action	.18		.14	.15	.11			
Home								
Subset Model R^2	3%		2%		1%		0%	
Barriers								
Remodel			-.14	-.17				
Priorities							-.13	
Subset Model R^2	0%		2%		0%		2%	
Full Model R^2		21%		16%		10%		9%

Notes. Subset Models contain only variables in each grouping, while all variables were entered in the Full Model. All R^2 $p < .001$. See page 10-11 for an explanation of variable coding and excluded variables. Standardized B ($p < .05$).

* The reference group is "More than $100,000."

APPENDIX B. SURVEY

Protecting Your Home from Wildfire

Conducted by

DEPARTMENT OF HUMAN DIMENSIONS OF NATURAL RESOURCES
Colorado State University, Colorado State University
and
Pacific Southwest Research Station,
United States Forest Service

WITH FUNDING FROM THE
Joint Fire Sciences Program

Your help on this study is greatly appreciated!
Please return your completed questionnaire in the enclosed envelope.
The envelope is self-addressed and no postage is required.

The JFSP is an interagency research, development, and applications partnership

Privacy and Paperwork Reduction Act statements: 16 U.S.C. 1642(a) authorized collection of this information. This information will be used by the U.S. Forest Service to better serve the public. Response to this request is voluntary. No action may be taken against you for refusing to supply the information requested. When analysis of the questionnaires is completed, all name and address files will be destroyed. Thus, the permanent data will not be linked to you in any way. Please do not put your name or that of any member of your household on the questionnaire.
Burden and Nondiscrimination Statements: According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0230. The time required to complete this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.
The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call toll free (866) 632-9992 (voice). TDD users can contact USDA through local relay or the Federal relay at (800) 877-8339 (TDD) or (866) 377-8642 (relay voice). USDA is an equal opportunity provider and employer.

SECTION I. YOUR RESIDENCE

1. Is the address to which we sent this survey your primary residence? ☐ Yes ☐ No

2. Do you live at this residence year round? ☐ Yes ☐ No

3. Do you own or rent this property? ☐ Own ☐ Rent

4. How long have you lived in this residence? _____ Years

5. Which best describes this residence? **(*Check (√) one*)**
   - ☐ A one-family house – detached from any other house
   - ☐ A one-family house – attached to one or more houses
   - ☐ A mobile home or trailer
   - ☐ Other (please specify): _____

6. Were you involved in the design of this residence? ☐ Yes ☐ No

7. What is the size of your lot? (*If less than one acre, please write "1"*) _____ acres

8. Is this residence located in a subdivision?
   - ☐ No
   - ☐ Yes If yes, which one? _____

9. Do you belong to a homeowners' or property owners' association?
   - ☐ No
   - ☐ Yes If yes, which one? _____

10. About how far is this residence from a *forested area*? **(*Check (√) one*)**

☐ I live within a forested area	☐ 5 – 10 miles	☐ 21 – 50 miles
☐ Less than 1 mile	☐ 10 – 15 miles	☐ 50 - 100 miles
☐ 1 – 5 miles	☐ 15 – 20 miles	☐ More than 100 miles

11. In general, which of the following ***best*** describes the vegetation on this property? **(*Check (√) one*)**

☐ Irrigated lawn	☐ Dense mature shrubs with dead branches
☐ Grass, shrub, less than 2 feet tall, no trees	☐ Dense shrubs with some trees
☐ Grass, shrub, less than 4 feet; widely dispersed trees	☐ Many trees, touching; some grass and brush
☐ Dense young shrubs, no dead wood or trees	☐ Dense evergreen trees with grass and shrubs
☐ Thick, tall grass	☐ Other: _____

12. What is the approximate slope of the land immediately surrounding this residence? **(*Check (√) one*)**

☐ Flat to gently sloping	☐ Moderately steep	☐ Very steep

SECTION II. HOMEOWNER DEFENSIBLE SPACE ACTIVITIES

The following pages define things that homeowners can do to protect their homes from a wildland fire. Please read the definition and answer the questions that follow. The photos illustrate the definition.

Defensible space creates an area around your house where vegetation (e.g., trees, shrubs, and branches) is cleared or reduced to help protect your home from a wildland fire. It also reduces the chance of a fire moving from a building to a nearby forest. Defensible space allows firefighters to do their jobs more effectively. Defensible space activities include (but are not limited to) the following:

- Reducing the density of trees within 75 feet of the home
- Removing overhanging branches within 10 feet of the roof
- Cleaning roof surfaces and gutters
- Ensuring that trees & shrubs are at least 15 feet apart

Homes **WITHOUT** defensible space

Homes **WITH** defensible space

1. How familiar are you with *defensible space* activities? **(*Circle one number*)**

1	2	3	4	5	6	7
Not at all familiar		Slightly familiar		Moderately familiar		Extremely familiar

2. Do you believe defensible space activities make your home/property *safer* in the event of a wildland fire? **(*Circle one number*)**

1	2	3	4	5	6	7
Makes no difference		Slightly safer		Moderately safer		Extremely safer

3. Do you believe defensible space activities make your home/property *look better or worse*? **(*Circle one number*)**

1	2	3	4	5	6	7
Extremely worse	Moderately worse	Slightly worse	Neither	Slightly better	Moderately better	Extremely better

4. In the last 5 years, have you done any of the following defensible space activities at this residence/property?

(***Check all that apply or Does Not Apply to this residence***)	**Does Not Apply**
☐ Cleaned roof surfaces/gutters to avoid accumulation of leaves at least twice a year	☐
☐ Trimmed branches that extend over your roof	☐
☐ Removed all flammable vegetation from within 15 feet of all structures	☐
☐ Reduced the density of trees within 75 feet of your residence	☐
☐ Pruned branches within 75 feet of your residence to a height of 10 feet above the ground	☐
☐ Cut down trees under electrical lines	☐
☐ Removed dead limbs, leaves, and other debris within 75 feet of your residence	☐
☐ Mowed grasses/weeds to less than 6 inches	☐
☐ Stacked firewood at least 30 feet from and uphill of all structures	☐
☐ Placed fuel containers at least 30 feet from and uphill of all structures	☐

5. How *effective* do you believe each of the following defensible space activities are in protecting this residence/property from a wildland fire? **(*Circle one number for each statement*)**

Defensible Space Activities	**Not at all Effective**		**Slightly Effective**		**Moderately Effective**		**Extremely Effective**	**Does Not Apply**
Cleaning roof surfaces/gutters to avoid accumulation of leaves	1	2	3	4	5	6	7	☐
Trimming the branches that extend over your roof	1	2	3	4	5	6	7	☐
Removing flammable vegetation from within 15 feet of all structures	1	2	3	4	5	6	7	☐
Reducing the density of trees within 75 feet of your residence	1	2	3	4	5	6	7	☐
Pruning branches within 75 feet of your residence to a height of 10 feet above the ground	1	2	3	4	5	6	7	☐
Cutting down trees under electrical lines	1	2	3	4	5	6	7	☐
Removing dead limbs, leaves, and other debris within 75 feet of your residence	1	2	3	4	5	6	7	☐
Mowing grasses/weeds to less than 6 inches	1	2	3	4	5	6	7	☐
Stacking firewood at least 30 feet from and uphill of all structures	1	2	3	4	5	6	7	☐
Placing fuel containers at least 30 feet from and uphill of all structures	1	2	3	4	5	6	7	☐

6. How *likely* are you to do each of the following defensible space activities in the ***next year***?
(*Circle one number for each activity or Check Does Not Apply to this residence*)

Defensible Space Activities	Not at all Likely		Slightly Likely		Moderately Likely		Extremely Likely	Does Not Apply
Clean roof surfaces/gutters of leaves	1	2	3	4	5	6	7	☐
Trim the branches that extend over your roof	1	2	3	4	5	6	7	☐
Remove flammable vegetation from within 15 feet of structures	1	2	3	4	5	6	7	☐
Reduce the density of trees within 75 feet of your residence	1	2	3	4	5	6	7	☐
Prune the branches within 75 feet of your residence to a height of 10 feet above the ground	1	2	3	4	5	6	7	☐
Cut down trees under electrical lines	1	2	3	4	5	6	7	☐
Remove dead limbs, leaves, and other debris within 75 feet of your residence	1	2	3	4	5	6	7	☐
Mow grasses/weeds to less than 6 inches	1	2	3	4	5	6	7	☐
Stack firewood at least 30 feet from and uphill of all structures	1	2	3	4	5	6	7	☐
Place fuel containers at least 30 feet from and uphill of all structures	1	2	3	4	5	6	7	☐

SECTION III. HOMEOWNER FIREWISE CONSTRUCTION ACTIVITIES

Firewise construction is the use of fire-resistant materials in the construction and remodeling of homes.
Firewise construction lessens a home's chances of catching on fire during a wildland fire.
Firewise construction modifications include (but are not limited to) the following:

- Fire resistant roofs (e.g., aluminum, steel, concrete, clay, slate)
- House exteriors made of fire resistant material (e.g., metal, stucco, stone, tile, heavy timber, masonry)
- Enclosure of the undersides of decks and balconies
- Windows, doors, and eaves that allow for proper air venting

Home made of heavy timber

Home with enclosed deck

Home made of stucco

Home with aluminum roof

1. How familiar are you with *firewise construction*? **(*Circle one number*)**

1	2	3	4	5	6	7
Not at all familiar		Slightly familiar		Moderately familiar		Extremely familiar

2. Do you believe firewise construction modifications make your home *safer* in the event of a wildland fire? **(*Circle one number*)**

1	2	3	4	5	6	7
Makes no difference		Slightly safer		Moderately safer		Extremely safer

3. Do you believe firewise construction modifications make your home *look better or worse*? **(*Circle one number*)**

1	2	3	4	5	6	7
Extremely worse	Moderately worse	Slightly worse	Neither	Slightly better	Moderately better	Extremely better

4. Does this residence have any of the following *firewise construction* modifications? **(*Check all that apply or Does Not Apply to this residence*)**

Firewise Construction Activities	Yes, completed by previous owner	Yes, I completed this myself	No	Does Not Apply
Fire resistant roof	☐	☐	☐	☐
Fire resistant siding on house or other buildings	☐	☐	☐	☐
Fire resistant decking	☐	☐	☐	☐
Chimney screen or spark arrestor	☐	☐	☐	☐
Screens over roof vents	☐	☐	☐	☐
Enclosed roof eaves with fire resistant soffits	☐	☐	☐	☐
Windows or sliding glass doors that are multi-pane glass	☐	☐	☐	☐
Enclosed undersides of decks or balconies	☐	☐	☐	☐
Emergency water supply	☐	☐	☐	☐
House number in a clearly visible place	☐	☐	☐	☐

5. How *effective* do you believe each of the following firewise construction modifications are in protecting your residence from a wildland fire? **(*Circle one number for each activity*)**

Firewise Construction Activities	Not at all Effective		Slightly Effective		Moderately Effective		Extremely Effective	Does Not Apply
Fire resistant roof	1	2	3	4	5	6	7	☐
Fire resistant siding on house or other buildings	1	2	3	4	5	6	7	☐
Fire resistant decking	1	2	3	4	5	6	7	☐
Chimney screen or spark arrestor	1	2	3	4	5	6	7	☐
Screens over roof vents	1	2	3	4	5	6	7	☐
Enclosing roof eaves with fire resistant soffits	1	2	3	4	5	6	7	☐
Multi-pane glass windows or sliding glass doors	1	2	3	4	5	6	7	☐
Enclosing undersides of decks and balconies	1	2	3	4	5	6	7	☐
Emergency water supply	1	2	3	4	5	6	7	☐
House number in a clearly visible place	1	2	3	4	5	6	7	☐

6. How *likely* are you to do each of the following firewise construction modifications at this residence in the ***next year***? **(*Circle one number for each activity or Check Does Not Apply to this residence*)**

Firewise Construction Activities	Not at all Likely		Slightly Likely		Moderately Likely		Extremely Likely	Does Not Apply
Install a fire resistant roof	1	2	3	4	5	6	7	☐
Install fire resistant siding on house or other buildings	1	2	3	4	5	6	7	☐
Install fire resistant decking	1	2	3	4	5	6	7	☐
Install a chimney screen or spark arrestor	1	2	3	4	5	6	7	☐
Install screens over roof vents	1	2	3	4	5	6	7	☐
Enclose roof eaves with fire resistant soffits	1	2	3	4	5	6	7	☐
Install multi-pane glass windows or sliding glass doors	1	2	3	4	5	6	7	☐
Enclose undersides of decks and balconies	1	2	3	4	5	6	7	☐
Install an emergency water supply	1	2	3	4	5	6	7	☐
Install house number in a clearly visible place	1	2	3	4	5	6	7	☐

SECTION IV. BARRIERS TO DEFENSIBLE SPACE AND FIREWISE CONSTRUCTION

When deciding whether to take action to reduce the risk of loss due to wildland fire on your property, how much of a barrier is each of the following items? **(*Circle one number for each statement*)**

	Not a Barrier		**Minor Barrier**		**Moderate Barrier**		**Extreme Barrier**
Cost of doing defensible space activities	1	2	3	4	5	6	7
Cost of firewise construction activities	1	2	3	4	5	6	7
Time it takes to implement actions	1	2	3	4	5	6	7
Lack of knowledge about defensible space	1	2	3	4	5	6	7
Lack of knowledge about firewise construction	1	2	3	4	5	6	7
Availability of expert advice	1	2	3	4	5	6	7
Disagreement with recommended actions	1	2	3	4	5	6	7
Neighbors do not do defensible space	1	2	3	4	5	6	7
Lack of authority to make changes to property	1	2	3	4	5	6	7
Not enough space on property to make recommended defensible space changes	1	2	3	4	5	6	7
Physical difficulty of doing the work	1	2	3	4	5	6	7
Amount of work it would take to make the recommended changes	1	2	3	4	5	6	7
Lack of equipment (e.g., chain saw)	1	2	3	4	5	6	7
The terrain on my property	1	2	3	4	5	6	7
Aesthetic impact on my property	1	2	3	4	5	6	7
Would decrease the natural look of my property	1	2	3	4	5	6	7
Would decrease my privacy	1	2	3	4	5	6	7
Requires remodeling my home	1	2	3	4	5	6	7
Nowhere to dispose of plant/tree material	1	2	3	4	5	6	7
Personal priorities	1	2	3	4	5	6	7
Not at this residence enough to worry	1	2	3	4	5	6	7
Other (please specify): _____	1	2	3	4	5	6	7

SECTION V. BELIEFS ABOUT WILDLAND FIRE AND HOMEOWNER ACTIVITIES

Indicate below how strongly you agree or disagree with *each* of the following statements. While some statements may sound similar, please respond to each statement. **(*Circle one number for each statement*)**

	Strongly Disagree	**Moderately Disagree**	**Slightly Disagree**	**Neutral**	**Slightly Agree**	**Moderately Agree**	**Strongly Agree**
Homeowners should be personally responsible for protecting their homes from fire (e.g., creating defensible space).	1	2	3	4	5	6	7
Homeowners are the *most responsible* for protecting their homes, near a forest, from wildfire.	1	2	3	4	5	6	7
The community fire department is the *most responsible* for protecting homes, built near a forest, from wildfire.	1	2	3	4	5	6	7
Land management agencies are *most responsible* for protecting homes, built near a forest, from fire.	1	2	3	4	5	6	7
If a wildfire breaks out, the first priority of the agency managing that forest is to make sure private property is not destroyed.	1	2	3	4	5	6	7
If a wildfire breaks out, the first priority of land management agencies is to ensure public safety.	1	2	3	4	5	6	7
Laws should prohibit people from building homes near forests where they can be burned by fires.	1	2	3	4	5	6	7
People should be allowed to build homes where they want, even if it is in a high wildfire zone.	1	2	3	4	5	6	7
Homeowners near a forest should be required by law to take steps necessary to protect their homes from wildfire.	1	2	3	4	5	6	7
In the event of a forest fire, my home would be protected by firefighters.	1	2	3	4	5	6	7
Creating defensible space around homes should be voluntary.	1	2	3	4	5	6	7
Homes with defensible space should be protected from forest fire before homes that HAVE NOT taken such steps.	1	2	3	4	5	6	7
New home construction should be required by law to use fire resistant materials.	1	2	3	4	5	6	7
Using fire resistant materials in construction should be voluntary.	1	2	3	4	5	6	7
Creating defensible space around my home makes it safer for firefighters.	1	2	3	4	5	6	7
Without defensible space, firefighters will not be able to protect my home.	1	2	3	4	5	6	7
Defensible space activities are not necessary because my insurance company will cover any losses due to wildfire.	1	2	3	4	5	6	7
My defensible space activities will be ineffective if my neighbors do not take similar actions.	1	2	3	4	5	6	7

SECTION VI. WILDLAND FIRE RISK

1. How likely do you think it is that a wildland fire will occur at each of the following in the near future? **(*Circle one number for each statement*)**

	Not at all Likely		**Slightly Likely**		**Moderately Likely**		**Extremely Likely**
Your residence/property	1	2	3	4	5	6	7
The neighborhood/community in which you live	1	2	3	4	5	6	7

2. To what extent do you think a wildland fire would cause damage to each of the following? ***(Circle one number for each statement*)**

	No Damage		**Some Damage**		**Moderate Damage**		**A lot of Damage**
Your residence/property	1	2	3	4	5	6	7
The neighborhood/community in which you live	1	2	3	4	5	6	7

3. How much do you think each of the following contributes to the chances of a wildland fire damaging your property? **(*Circle one number for each statement*)**

	Not at all		**Slightly**		**Moderately**		**A lot**
Vegetation on your property	1	2	3	4	5	6	7
Physical characteristics of your property other than vegetation (e.g., steep inclines)	1	2	3	4	5	6	7
Physical characteristics of your house (e.g., roofing or siding)	1	2	3	4	5	6	7
Vegetation on your neighbors' properties	1	2	3	4	5	6	7
Vegetation on nearby public land	1	2	3	4	5	6	7
Diseases and pests (e.g., bark beetle, dwarf mistletoe)	1	2	3	4	5	6	7
Visibility of your home address to firefighters	1	2	3	4	5	6	7
Poorly marked roads	1	2	3	4	5	6	7
Road access for firefighting vehicles	1	2	3	4	5	6	7
Availability of a water supply source	1	2	3	4	5	6	7
Other (please specify): _____	1	2	3	4	5	6	7

SECTION VII. COMMUNITY WILDFIRE PROTECTION

1. Does your community, subdivision, or homeowner/property owner association have a Community Wildfire Protection Plan? **(*Check (√) one*)**

   ☐ Yes, one community-wide plan
   ☐ Yes, my subdivision or homeowner/property owner association has a plan
   ☐ No, but one is in development
   ☐ No
   ☐ Unsure

2. Does your subdivision or homeowner association have ordinances or requirements for any of the following? **(*Check (√) one for each statement*)**

   Defensible space (e.g., trees spaced apart) ☐ No ☐ Unsure ☐ Yes – If yes, what type of defensible space? _____

   Specific roofing material (e.g., metal, wood shake) ☐ No ☐ Unsure ☐ Yes – If yes, what type of roofing material? _____

3. Below is a list of community related activities that residents can undertake to prepare for wildland fire. Please respond to *each* statement in both column A and column B.

	Column A		**Column B** How likely are you to do this activity this year								
Community Activities	**Do you do this now?**		**Not at all Likely**		**Slightly Likely**		**Moderately Likely**			**Extremely Likely**	
Attend community-based meetings related to wildland fire	Yes	No	1	2	3	4	5	6	7	8	9
Attend a public meeting about defensible space	Yes	No	1	2	3	4	5	6	7	8	9
Participate in a Community Wildfire Protection Plan	Yes	No	1	2	3	4	5	6	7	8	9
Participate in a FireWise Council or similar organization	Yes	No	1	2	3	4	5	6	7	8	9
Help organize community education programs related to wildland fire	Yes	No	1	2	3	4	5	6	7	8	9
Participate in wildfire-related events (e.g., debris collection day)	Yes	No	1	2	3	4	5	6	7	8	9
Work with your neighbors to reduce the risk of wildland fire on your property or that of your neighbors	Yes	No	1	2	3	4	5	6	7	8	9
Volunteer within the community to help clear and remove combustible material (e.g., brush, litter)	Yes	No	1	2	3	4	5	6	7	8	9
Participate in a neighborhood or community effort to thin overly dense forest areas	Yes	No	1	2	3	4	5	6	7	8	9
Obtain additional information from a land management, community group, or firefighting agency on how to prepare for wildland fire	Yes	No	1	2	3	4	5	6	7	8	9
Consult with public officials or foresters	Yes	No	1	2	3	4	5	6	7	8	9
Other (please specify): _____	Yes	No	1	2	3	4	5	6	7	8	9

SECTION VIII. EXPERIENCE WITH WILDLAND FIRE

We would like to know about the kinds of experiences you have had with wildland fires. **(*Check (√) all that apply*)**

	No	In the last 5 years	Ever
Been injured as a result of a wildland fire	☐	☐	☐
Residence damaged or lost due to a wildland fire	☐	☐	☐
Had other personal property destroyed or damaged due to a wildland fire	☐	☐	☐
Experienced discomfort from the smoke of a wildland fire	☐	☐	☐
Had my work/job/livelihood affected by a wildland fire	☐	☐	☐
Been evacuated from my house due to a wildland fire	☐	☐	☐
Received a reverse 911 call to prepare to evacuate	☐	☐	☐
Know someone who has been injured as a result of a wildland fire	☐	☐	☐
Know someone who has been evacuated from her/his residence due to a wildland fire	☐	☐	☐
Know someone whose residence or property has been damaged or lost due to a wildland fire	☐	☐	☐
Know someone whose work/job/livelihood was affected by a wildland fire	☐	☐	☐

SECTION IX. INFORMATION SOURCES

Please select the response that indicates your agreement or disagreement with each of the following statements.
(*Circle one number for each statement*)

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
I know who to contact if I have questions about defensible space	1	2	3	4	5	6	7
I have discussed defensible space issues with my family	1	2	3	4	5	6	7
I have discussed defensible space issues with my neighbors	1	2	3	4	5	6	7
My awareness of defensible space issues has increased during the past year	1	2	3	4	5	6	7

From which of the following sources have you received information about reducing the risk of wildland fire?
(*Check (√) all that apply*)

☐ Neighborhood group (homeowners group, local board, etc.)
☐ Neighbors, friends, or family members
☐ Media (newspaper, TV, radio, internet)
☐ Local fire department
☐ County wildfire specialist
☐ Colorado State Forest Service
☐ Federal agency (e.g., BLM, U.S. Forest Service)
☐ Other →Please describe:
_____
☐ None of the above,
I have not received any information about reducing the risk of wildland fire

SECTION X. BELIEFS ABOUT YOUR NEIGHBORHOOD

For this section please think about the people who live near you at the residence where we sent this survey.
Please indicate below how strongly you agree or disagree with *each* of the following statements.
While some statements may sound similar, please respond to each statement. **(*Circle one number for each statement*)**

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
People in my neighborhood generally get along with each other	1	2	3	4	5	6	7
People in my neighborhood share the same values	1	2	3	4	5	6	7
My neighbors and I want the same things	1	2	3	4	5	6	7
I feel a strong sense of community with my neighbors	1	2	3	4	5	6	7
I recognize most of the people who live in my neighborhood	1	2	3	4	5	6	7
Most of my neighbors know me	1	2	3	4	5	6	7
I feel at home in this neighborhood	1	2	3	4	5	6	7
If there is a problem in my neighborhood, people who live here get it solved	1	2	3	4	5	6	7
I often take an active role in solving neighborhood problems	1	2	3	4	5	6	7
I care about what my neighbors think about my actions	1	2	3	4	5	6	7
It is important to me to live in this particular neighborhood	1	2	3	4	5	6	7
My community is a special place to live	1	2	3	4	5	6	7
I have an influence over what this community is like	1	2	3	4	5	6	7
This community is a good place for me to live	1	2	3	4	5	6	7
I expect to live in this community for a long time	1	2	3	4	5	6	7

SECTION XI. ABOUT YOURSELF

We would like to know a little about you. This information will remain completely confidential.

1. Are you? ☐ Male ☐ Female

2. How old are you? _____ Years

3. How many years of formal education have you completed? **(*Circle one number*)**

6 7 8 9 10 11 12	13 14 15 16	17 18 19 20 21 22
High School	College	Master's Doctorate

4. What is your approximate annual <u>household</u> income before taxes? **(*Check (√) one*)**

- ☐ Less than $10,000
- ☐ $10,000 to $24,999
- ☐ $25,000 to $49,999
- ☐ $50,000 to $74,999
- ☐ $75,000 to $99,999
- ☐ $100,000 to $124,999
- ☐ $125,000 to $149,999
- ☐ $150,000 to $174,999
- ☐ $175,000 to $199,999
- ☐ $200,000 to $224,999
- ☐ $225,000 to $249,999
- ☐ $250,000 and higher

Thank you very much for participating in this study!
Please return the completed survey as soon as possible in the enclosed addressed and postage-paid envelope.