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Living with Wildfire in Lake County, Colorado: 2023 Data Report

Colleen Donovan, Hannah Brenkert-Smith, Suzanne Wittenbrink, Patricia A. Champ, J.T. Shaver, Dave McCann, Christine Taniguchi, James R. Meldrum, Christopher M. Barth, Carolyn Wagner, Josh Kuehn

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Abstract: Homeowner wildfire risk mitigation and preparedness are important components of community wildfire readiness. This report describes the data collected through two efforts conducted in the Lake County, Colorado, study area: (1) parcel-level rapid wildfire risk assessments performed by trained assessors and (2) homeowner surveys in which respondents provided self-assessments of their parcel-level wildfire risk. This project was undertaken to support Colorado State Forest Service Salida Field Office and Leadville/Lake County Fire-Rescue. The household surveys explored the social dimensions of wildfire, including understanding of wildfire risk, outreach or communication preferences, mitigation and evacuation preparedness activities, and perceptions of community risk reduction strategies. Overall, the study results detail a community that was engaged in preparing for and mitigating the risk of wildfire while revealing more that could be done to reduce risk.

Keywords: WiRē (wildfire research), co-produced research, risk assessment, survey data, social science, community, resident, wildfire risk, preparedness, mitigation, wildland urban interface (WUI)

C**over:** Courtesy image by Josh Kuehn, WiRē Center, used with permission.

Authors

Colleen Donovan, Wildfire Research (WiRē) Center, Niwot, Colorado

Hannah Brenkert-Smith, University of Colorado Boulder, Institute of Behavioral Science, Boulder, Colorado

Suzanne Wittenbrink, Wildfire Research (WiRē) Center, Niwot, Colorado

Patricia A. Champ, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado

J.T. Shaver, Colorado State Forest Service, Salida Office, Salida, Colorado

Dave McCann, Leadville/Lake County Fire-Rescue, Leadville, Colorado

Christine Taniguchi, University of Colorado Boulder, Institute of Behavioral Science, Boulder, Colorado

James R. Meldrum, U.S. Geological Survey, Fort Collins Science Center, Fort Collins, Colorado

Christopher M. Barth, U.S. Department of Agriculture, Forest Service, Washington Office, Fire and Aviation Management, Missoula, Montana

Carolyn Wagner, Wildfire Research (WiRē) Center, Niwot, Colorado

Josh Kuehn, Wildfire Research (WiRē) Center, Niwot, Colorado

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1 Goolsby, Julia B.; Champ, Patricia A.; Wittenbrink, Suzanne; Donovan, Colleen; King, Kris; Brenkert- Smith, Hannah; Meldrum, James R.; Barth, Christopher M.; Wagner, Carolyn; Forrester, Chiara C. 2023. Living with wildfire in Lake Wenatchee, Chelan County, Washington: 2022 data report. Res. Note RMRS-RN-103. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 130 p. https://doi.org/10.2737/RMRS-RN-103.

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Executive Summary

In 2022 and 2023, the Wildfire Research (WiRē) Center partnered with Leadville/Lake County Fire Rescue (LLCFR) and the Colorado State Forest Service (CSFS) to better understand community wildfire risk in the areas surrounding the town of Leadville, Colorado and to identify how to effectively engage with residents about preparing for a wildfire event and mitigating wildfire risk around the home. This study was developed as a result of an ongoing collaboration between WiRē and the CSFS.

This study included collection of two types of data: rapid parcel-level wildfire risk assessment data and household survey data. The WiRē Rapid Wildfire Risk Assessment (WiRē RA) protocol measures parcel-level risk based on 13 attributes related to home ignition, defensible space, background conditions, and access to the property. The assessments were conducted on all properties with residential structures within the study area, which included 783 residential structures. Next, a survey was sent to was sent to 683 homeowners of which 160 returned a completed survey; this resulted in a 23 percent response rate. Overall, there were 158 properties for which a risk assessment paired with a household survey response. There are an additional 625 properties with only a risk assessment, for a total of 783 risk assessments in the study area. This report summarizes the results of the two data collection efforts.

Survey results indicate that respondents were aware of wildfire risk to their homes, but few expected to incur wildfire damage. Two-thirds (66%) of respondents stated they strongly agreed or agreed that their properties were at risk from wildfire despite almost no experience with wildfire while living in their Lake County home (figs. 21, 19). Notably, two-thirds (66%) expected that if a wildfire were to occur on their property, there was a greater than 50 percent chance of experiencing severe damage or destruction of their home (fig. 22). In the event of a wildfire on their properties, the majority of respondents thought it extremely or very likely their landscaping or homes would incur wildfire or smoke damage. Fewer thought it was extremely or very likely their home would be destroyed (31%) (fig. 24).

Twenty percent of respondents thought it was extremely or very likely the fire department would be able to save their homes in the event of a wildfire on their property (fig. 23). More broadly, few respondents indicated they strongly agreed or agreed that local firefighters have sufficient resources to (1) protect threatened homes (13%) or (2) keep a wildfire from spreading (6%) (fig. 45).

Survey results indicate that respondents perceived some but not all components of wildfire risk in the wildland urban interface (WUI). On the one hand, the majority of respondents identified vegetation on nearby public lands, on neighbors' properties, and on their own property, as well as the physical characteristics of their own home, as factors that contribute somewhat or a lot to the chances of wildfire damaging their property in the next twelve months (fig. 26). On the other hand, a comparison of WiRē RA and household survey results indicates that respondents differed in their evaluations of wildfire risk as compared to trained assessors (fig. 4). Particularly, as compared to the WiRē RA ratings, respondents thought they had better defensible space both in terms of the distance to overgrown, dense, or unmaintained vegetation (fig. 9) and distance to other (non-vegetation) combustibles (fig. 10). These differences may present an opportunity for educational outreach about wildfire risk mitigation and the need to prepare for an evacuation.

Most respondents reported performing activities such as regularly cleaning the roof and gutters, reducing vegetation around the home, and regularly mowing and raking around the home. Just under half reported hardening the home (e.g., changing conditions of home to reduce likelihood of the structure igniting, including replacing roof or siding; fig. 34). However, respondents reported several barriers that limit their ability to mitigate their property. Around 30–45 percent of respondents reported personal resource barriers, including time to do the work, financial cost, and physical ability to do the work (fig. 35). Thirty percent of respondents reported lack of information about how to reduce risk on their property as a barrier (fig. 36). Furthermore, around half of the respondents reported that information and resource incentives would encourage them to mitigate, including a cost share or financial assistance (56%), a report describing their property's risk factors (53%), help doing the work (47%) and a one-on-one visit to the property by a wildfire expert (44%) (figs. 39–40).

In addition to mitigation action, respondents also reported their current wildfire evacuation preparedness activities and information needs. Fifty-nine percent of respondents reported having an evacuation plan for the people in their household (fig. 32), though somewhat fewer reported having taken important evacuation planning steps, including identifying safe evacuation routes, what to take and what to leave behind, where to evacuate to, and where to stay long-term (fig. 33). Twenty-five percent of respondents have identified how they would be notified of an evacuation, and 22 percent of respondents reported having signed up for emergency notifications. Importantly, respondents indicated that they wanted more information about evacuation planning, particularly information on emergency notification (fig. 33).

Respondents reported receiving wildfire risk information from a range of sources, indicating that the communications landscape is not dominated by a single voice. Respondents reported receiving wildfire risk information from a range of sources, indicating that the communications landscape is not dominated by a single voice and that wildfire risk information sources were characterized as extremely or very useful for 30 to 50 percent of respondents, depending on source (fig. 30). While many respondents received information from the media, few found it useful (fig. 30). Respondents mostly preferred receiving information via email/e-newsletter, mailed newsletter, or by way of conversations with local wildfire specialists (fig. 31). Respondents most preferred to receive information via email/e-newsletter, mailed newsletter, or by way of conversations with local wildfire specialists (fig. 31).

Finally, in addition to results related to property-level risk mitigation, respondents reported their preferences related to community-level risk reduction strategies. Most respondents indicated strong support for each of the landscape-level fuel treatments listed, including removing trees and other vegetation in general, removing vegetation along roadways for safer evacuation, burning piles of vegetation, creating a fuel break, reducing other vegetation on homeowners association (HOA) property surrounding communities, and conducting a prescribed fire ignited by fire professionals (fig. 42). Aligning with support for prescribed fire, 90 percent of respondents stated they strongly agreed or agreed that wildfires are a natural part of a healthy forest ecosystem (fig. 44).

What is WiRē?

The Wildfire Research (WiRē) team partners with wildfire mitigation and education organizations to support the development of local, evidence-based wildfire programs that are tailored to the needs of individual communities. The team works with wildfire practitioners to collect, interpret, and use paired parcel-level wildfire risk and social data for all homes within study communities. While certain components of the data collection and analyses are standardized across all communities, local practitioners drive research questions, how the research is shared with their community and what kinds of wildfire risk mitigation programs develop from the research. Communities have used the data from this research to shape the programs they offer, populate grant proposals, and facilitate understanding of wildfire risk mitigation.

The WiRē Approach

The WiRē Approach includes two central data collection efforts:

1. A WiRē parcel-level rapid wildfire risk assessment (WiRē RA) based on attributes related to home structure characteristics, fuels near the home, background fuels and topography, and access to the property. The WiRē RA also includes an overall risk rating for the property. WiRē risk scores are not an absolute measure of risk but are estimates of risk using a standardized suite of variables observed by a particular person at one point in time (refer to Methods).
2. A household survey sent to the owner of each assessed property, which represents their notions of wildfire risk, how they communicate about wildfire risk, risk mitigation behaviors, including evacuation planning, and barriers and incentives to mitigate wildfire risk on private properties.

The WiRē Approach aims to empower the voice of wildfire practitioner partners. These partners participate in the data collection process and share the results with their communities. Experience has demonstrated that sharing results with the community provides a common platform for constructive discussion about adapting to wildfire. During these discussions, wildfire practitioner partners can draw from data that reflect the entire community, not just a vocal few. To support these discussions and other partner goals, WiRē works with partners to summarize and interpret research results.

WiRē compiles the data from individual projects to provide insights that transcend community uniqueness and contribute to the wildfire social science state of knowledge. In

addition, replication of the WiRē Approach within a study area can be used to monitor change over time.

Study Area: What Do the Community and Environment Look Like?

In 2022, the Colorado State Forest Service (CSFS) Salida Field Office and Leadville/Lake County Fire Rescue (LLCFR) engaged with the Wildfire Research (WiRē) Center to implement the WiRē Approach. The LLCFR was in the process of updating their Community Wildfire Protection Plan (CWPP) and were prioritizing community engagement—especially with the underserved Hispanic population—with respect to wildfire risk mitigation and evacuation preparation. The CSFS and LLCFR identified WUI communities surrounding Leadville proper (refer to fig. 1) to be included in the WiRē project. This was based on input from the operations chief at LLCFR who identified the community and forest areas surrounding the town of Leadville as a priority area due to forest and community conditions, along with prevailing winds that could drive wildfire through town and create the "next Marshall Fire or Camp Fire" event (referencing Superior/Louisville, CO and Paradise, CA fires).

General tree species composition within the study area consists of lodgepole pine (*Pinus contorta* Douglas ex Loudon) with a small component of Engelmann spruce (*Picea engelmannii* Parry ex Engelm.), subalpine fir (*Abies lasiocarpa* (Hook.) Nutt.), and quaking aspen (*Populus tremuloides* Michx.). The current volume of standing timber (i.e., average basal area) for the study area is on average 142 ft^2/acre. The main concern in the lodgepole pine forests is the health and condition of the forest due to the high number of trees that are not typical for this type of tree species. Other issues include suppressed tree growth, low diversity of other plant and tree species, and ecosystem health issues such as insects and diseases (i.e. dwarf mistletoe [*Arceuthobium* M. Bieb.]).

The project area includes approximately ten subdivisions that are nestled in classic WUI conditions. These are mostly lots of 1 to 40 acres in size consisting of one single family residence. There is a variety of lived-in homes, second homes and short-term rentals. The project area also includes three mobile home parks, which were included in the risk assessments conducted for this project. Two of the parks are adjacent to Highway 24, while the third is off Highway 91. The three communities marked by notable biophysical danger and LLCFR identified elevated interest in improving emergency preparedness. Community residents were noted by the LLCFR to be socio-economically vulnerable residents who commute to Summit and Eagle Counties for hourly wages. English is a second language for a portion of this population.

This project followed the standard WiRē Approach that entails mailing household surveys to property owners. During the data collection period, it became apparent that the mobile home park property owners would not be well represented in this study for several reasons. First, a large portion of surveys were returned undeliverable. Second, among surveys that were successfully delivered, only five property owners responded. Given that this part of the study area was of great concern to the LLCFR, the WiRē team applied for and was awarded a small Federal Emergency Management Administration grant administered through the University of Colorado's Natural Hazards Center Quick Response Research Award Program. These funds were used to tailor a follow-up data collection effort specific to the residents in the three

mobile home parks. The results are not reported in this report, but can be found here: https://hazards.colorado.edu/quick-response-report/preparing-mobile-home-park-residents-for-wildfire-in-lake-county-colorado.

The remainder of this report summarizes the findings from the standard WiRē Approach.

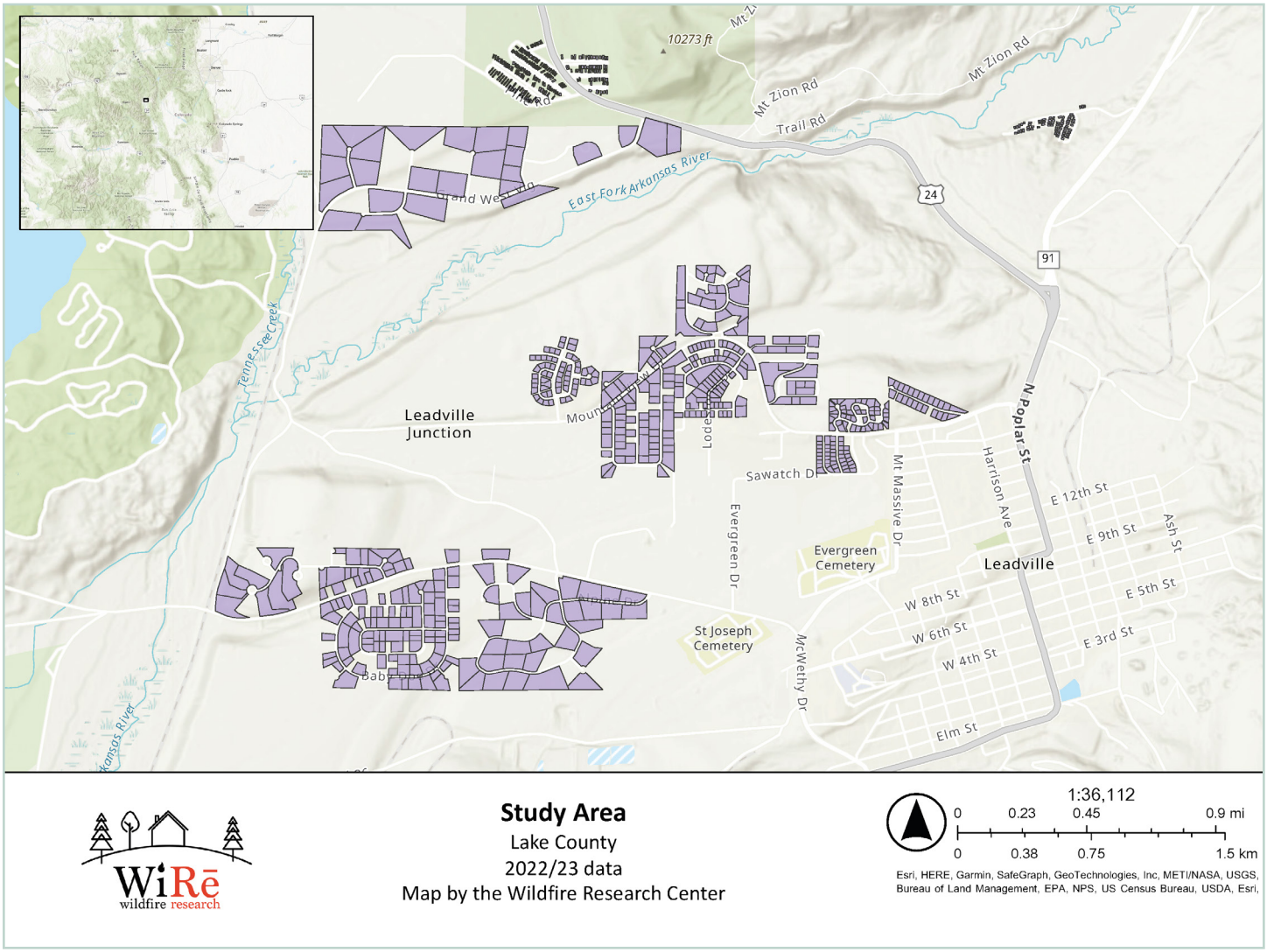

Figure 1—Map of residential parcels in the Lake County, Colorado, study area. Inset shows the location of the study area in Colorado. Map image is the intellectual property of Esri and is used herein under license. Copyright © 2020 Esri and its licensors. All rights reserved.

WiRē Partner: Colorado State Forest Service Salida Field Office

The CSFS is the forestry outreach agency of the Warner College of Natural Resources at Colorado State University. The CSFS Salida Field Office serves Chaffee and Lake Counties by providing various forestry services and outreach on private and State lands. Of particular concern for the Salida Field Office is facilitating the creation of fire adapted communities in the WUI. The Salida Field Office engages in several programmatic initiatives toward this effort.

The Salida Field Office's homeowner wildfire education and mitigation program is designed to assess and map the wildfire risk associated with Lake County's WUI. Included in the

program are home site visits available to WUI residents for information regarding the risk to their property or home and options for reducing said risk. The Salida Field Office also works with WUI communities to coordinate the implementation of larger scale cross-boundary fuels treatments. These include but are not limited to roadside thinning for enhancement of ingress/egress safety and the creation of fuel breaks to reduce potential wildfire activity.

Much of the work that the Salida Field Office completes is directly tied to the planning efforts of Lake County Forest Health Council, a team of leaders from various backgrounds that seeks to provide strategic solutions to the growth of the region. The major driving force associated with Lake County Forest Health Council that guides the actions of the CSFS Salida Field Office is the 2022 Lake County CWPP. This plan intends to substantially alter how forests are managed in Lake County. One of the most powerful tools included in the plan is a fuels treatment priority map that provides guidance toward specific locations within Lake County where projects will have the most impact. The Salida Field Office seeks to implement projects in the highest priority treatment areas according to the 2022 CWPP.

WiRē Partner: Leadville/Lake County Fire Rescue

The LLCFR is the primary emergency services organization serving the community of Leadville and Lake County, Colorado. As a combined fire and emergency medical services provider, LLCFR is responsible for safeguarding both the urban and rural areas within Lake County, which is known for its high altitude, mountainous terrain, and remote locations.

The LLCFR operates a variety of equipment and resources to handle a wide range of emergencies, including structure fires, wildfires, medical emergencies, hazardous materials incidents, and technical rescues. The department is composed of dedicated career and volunteer firefighters who work together to provide timely and professional services to residents and visitors in one of Colorado's highest elevation areas. In addition to emergency response, the LLCFR focuses heavily on public safety education and prevention. It conducts fire safety training programs, emergency preparedness initiatives, and community outreach to ensure that residents are well informed about safety practices, especially in fire-prone areas. Specific to this report, the LLCFR emphasizes public education as it relates to home defensible space and evacuation preparation.

The fire department is known for its close-knit team, which works to maintain high levels of preparedness through continuous training and specialized certifications. The challenges of operating in the mountainous and often unpredictable environment of Leadville and Lake County require a unique set of skills, including search and rescue techniques, automobile extrications, and managing wildland fires in challenging terrain. The LLCFR is a cornerstone of safety for the community, providing critical emergency services and supporting the health and well-being of Lake County residents and visitors alike.

Methods: What Did We Do?

In 2022 and 2023, WiRē partnered with the CSFS's Salida Field Office and the LLCFR to implement the WiRē Approach. The WiRē Approach is a systematic approach to data collection that includes a WiRē parcel-level rapid wildfire risk assessment (WiRē RA) and household survey data collection. Together, these two forms of data collection support better understandings of wildfire risk and the residents whose decisions and actions shape the community landscape. The study launched with the mailing of an initial letter in September

2022 to inform residents in the study area of the upcoming activities (Refer to Appendix A for correspondence materials and household survey).

WiRē Parcel-Level Rapid Wildfire Risk Assessments

WiRē conducted several trainings for mitigation specialists at the CSFS (hereafter referred to as the "trained assessors") on how to collect WiRē RAs on all residential properties with a structure in the study area (refer to table 1).

Table 1—Timing of the Wildfire Research (WiRē) risk assessment (RA) trainings.

Training topic	Participants	Date of Training
Virtual training on the WiRē RA attributes	Colorado State Forest Service, Salida Office; Leadville/Lake County Fire Rescue	July 13, 2022
In-person training on using the FieldMaps data collection tool and collecting data in the field	Colorado State Forest Service, Salida Office; Leadville/Lake County Fire Rescue; Arkansas River Watershed Collaborative	September 19, 2022

The WiRē RAs were conducted for 783 residential properties in 2022 and 2023. The WiRē RA is composed of a set of 13 attributes that include home structure characteristics, vegetation near the home, background fuels and topography, and access to the property.

To calculate a parcel's overall "risk score" (continuous number on a 1000-point scale), each WiRē RA attribute is weighted, reflecting its relative contribution to parcel-level wildfire risk. For example, because roofing materials can present a more significant risk than address posting, these attributes are weighted differently, constituting 30 percent and 1 percent of the overall risk score, respectively. Refer to Appendix B for specific rapid assessment attribute weightings.[1]

To support comparison of risk across properties, the overall risk scores for each parcel are placed into five categorical "risk ratings" (low, moderate, high, very high, and extreme). These risk ratings are defined by the distribution of risk scores in WiRē's compiled dataset, which includes all applicable WiRē studies to date. Specifically, the cutoffs between each risk rating are the 10th, 25th, 75th, and 90th percentile of the full distribution across WiRē studies. This resulted in the following overall risk ratings: low (20–250), moderate (251–325), high (326–455), very high (456–540), extreme (541–1,000).

Importantly, a parcel-level risk rating does not account for all components of risk, including variable or extreme weather conditions and some factors which can only be captured during a comprehensive on-site consultation (e.g., vent screen size, windows, fire-resistant flashing, etc.). Thus, WiRē risk scores are not an absolute measure of risk but are estimates of risk using a standardized suite of variables observed by a particular person at one point in time.

1 Refer to Meldrum et al. 2022 for a detailed accounting of the attributes and literature that justifies the inclusion of the different risk attributes.

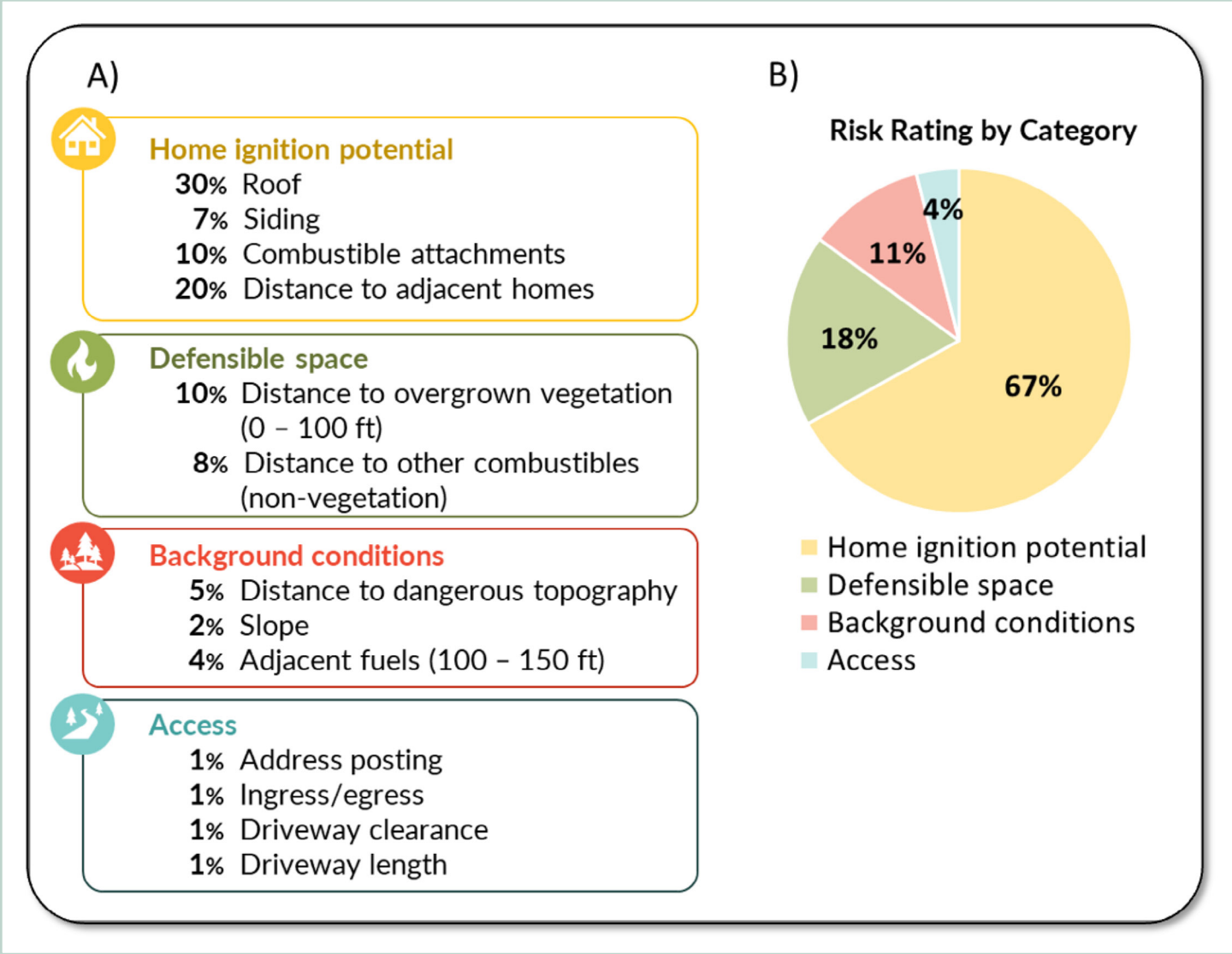

Figure 2—Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) A) Relative weight of each risk attribute within the overall risk score. B) Relative weight of each risk category within the overall risk score.

Data were collected using ArcGIS FieldMaps, and WiRē developed and shared a standardized reference sheet for trained assessors to use in the field (refer to Appendix B for the Assessor Reference Guide).

All WiRē RAs were conducted by the CSFS Salida Field Office staff, on behalf of the LLCFR, on all residential properties in the study area unless access was blocked by a gated driveway or posted with no trespassing signage. In instances when the trained assessors could not observe a risk attribute, the assessor selected "unknown/not observed." During data processing, these responses were assigned to the highest risk score. In this study, fewer than two percent of parcels were coded as "unknown/not observed" for each risk attribute, except for the attribute related to distance from overgrown vegetation, which had 11 percent coded as such.

Household Survey

The household survey was designed to collect a range of social data related to how residents in the study area live with the risk of wildfire. Most of the survey questions are standardized

across WiRē studies. However, some questions were tailored to address the interests of the CSFS Salida Field Office and the LLCFR. For example, we added a new set of questions to help identify how residents think about the effect of burning and manual/mechanical vegetation removal on the look of the landscape (short and long term), forest health, and water quality. WiRē worked collaboratively with these groups to develop the final version of the household survey. The household survey was mailed to the homeowners of all the properties for which a WiRē RA was completed.[2] Household survey data were collected using a modified Dillman approach[3], which includes three mailings after the initial letter announcing the data collection efforts (refer to table 2 for survey administration timing). The first mailing was a survey packet containing a cover letter, a household survey, and a postage-paid and addressed return envelope. The second mailing, a reminder/thank you postcard, was mailed to the entire mailing list approximately 1 month after the initial survey packet. The final mailing was a second complete survey packet with an updated cover letter mailed to non-respondents approximately 1 month after the reminder postcard.

The household survey was sent to 683 households. The number of surveys returned was 160, resulting in a 24 percent response rate.

Table 2—Timing of the household survey administered to residents in the study area by Colorado State Forest Service Salida Field Office, Leadville/Lake County Fire Rescue, and Wildfire Research (WiRē) to collect information related to wildfire risk.

Mailing	Date of Mailing
Initial letter	09/29/2022
First survey package	08/29/2023
Postcard reminder	09/15/2023
Second survey package	10/26/2023

A Comparison of Risk Assessment: Results of the Wirē Parcel-Level Rapid Wildfire Risk Assessment and Household Survey

A total of 783 WiRē RAs were conducted by trained assessors. The trained assessors categorized the parcels' overall risk as follows: low risk (1%), moderate risk (9%), high risk (47%), very high risk (28%) or extreme risk (15%). For more details, refer to Appendix C, table 1.1.

Of the 160 household surveys returned by respondents in the study area, 158 were paired with the WiRē RA ("paired data," refer to fig. 3). The data reported in the section below represent only the paired data—properties for which a household survey was completed and there is an associated WiRē RA.

2 As part of the WiRē Approach, one survey is sent to each individual homeowner in the study area. If an individual owns multiple properties, they receive only one survey with a prompt to select a specific property address. As a result, the number of household surveys mailed out is different from the total number of WiRē parcel-level rapid wildfire risk assessments conducted.

3 For details, refer to Dillman, Don A. 2000. Internet and mail surveys: The Tailored Design Method, 2000. New York: John Wiley. 480 p.

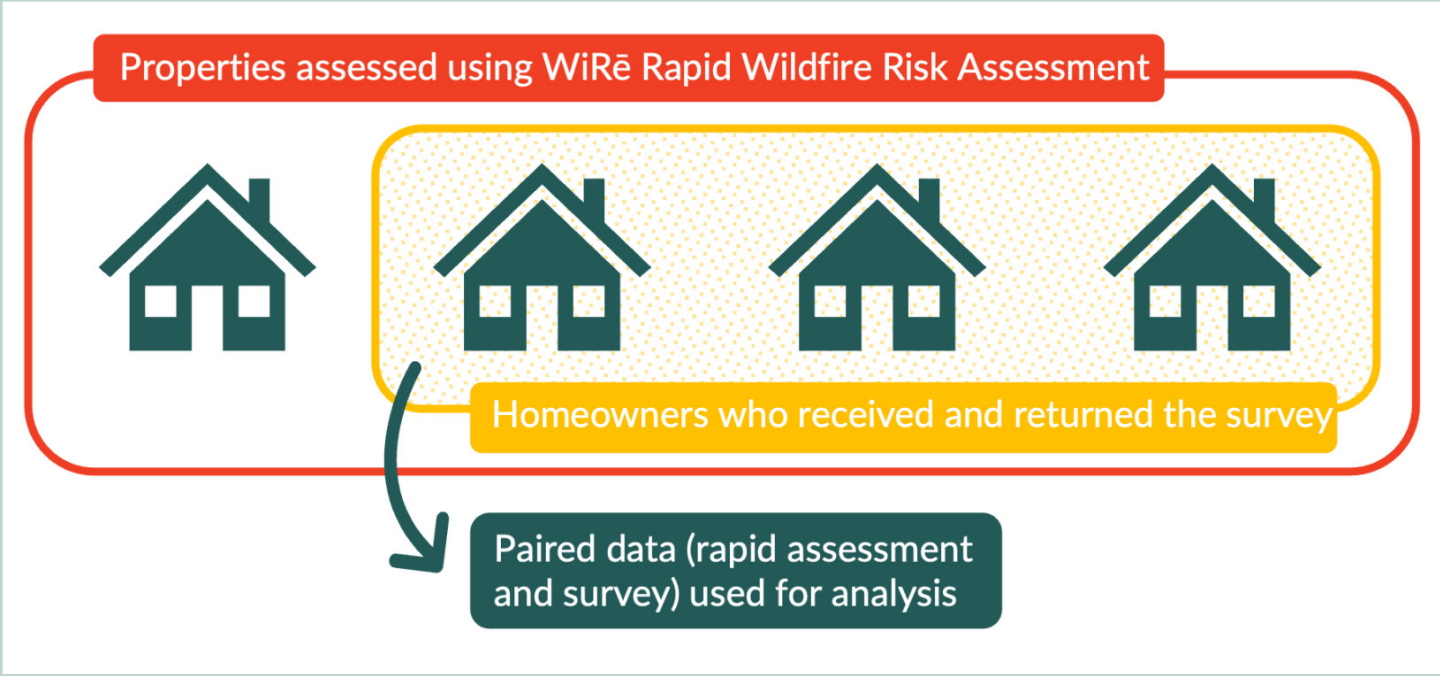

Figure 3—Representation of the Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) and household survey data collected in a WiRē project, which are combined to produce the paired data.

Among non-mobile home park respondent statistical tests were performed to assess whether parcel-level wildfire risk was different for parcels whose residents responded to the household survey (i.e., the paired data) compared to parcels in the study area whose residents did not respond. Among non-mobile home park respondents there were no statistical differences.

Risk Attributes: Observed in the WiRē Parcel-Level Rapid Wildfire Risk Assessments vs. Self-Assessed by Household Survey Respondents

The WiRē RA and household survey data were compared by looking at the overall wildfire risk rating and the results for each of 13 risk attributes (refer to fig. 2) as reported by trained assessors and survey respondents, respectively. The results below are organized by overall risk and then risk categories of home ignition potential, defensible space, background conditions, and access.

Overall wildfire risk rating—

Survey respondents evaluated their properties for each of 13 risk attributes included in the WiRē RA. They were also asked to provide an assessment of their properties' overall wildfire risk by selecting one of the following response options: low, moderate, high, very high, or extreme risk. This scale matches the WiRē RA's overall risk rating scale; however, unlike the survey, the WiRē RA's overall ratings were calculated by adding the weighted scores of the 13 individual risk attributes and assigning a risk category (i.e., low, moderate, high, very high, extreme) based on the summed score.[4] The WiRē RA overall ratings reflect the relative weight of the various attributes (e.g., a wood roof is 30% of the overall risk score). Comparing

4 Refer to Appendix B and Appendix C for more information on the risk scores.

the WiRē RA data to survey responses provides insight into the differing risk perspectives of residents and trained assessors.

Overall wildfire risk ratings reported by survey respondents were lower on average than those in the observed WiRē RA data. Ratings in the high-risk category best exemplify this trend: fewer survey respondents (20%) rated their parcels as high risk of wildfire compared to the WiRē RA (59%). Most survey respondents (61%) rated their parcels as moderate risk of wildfire (refer to fig. 4).

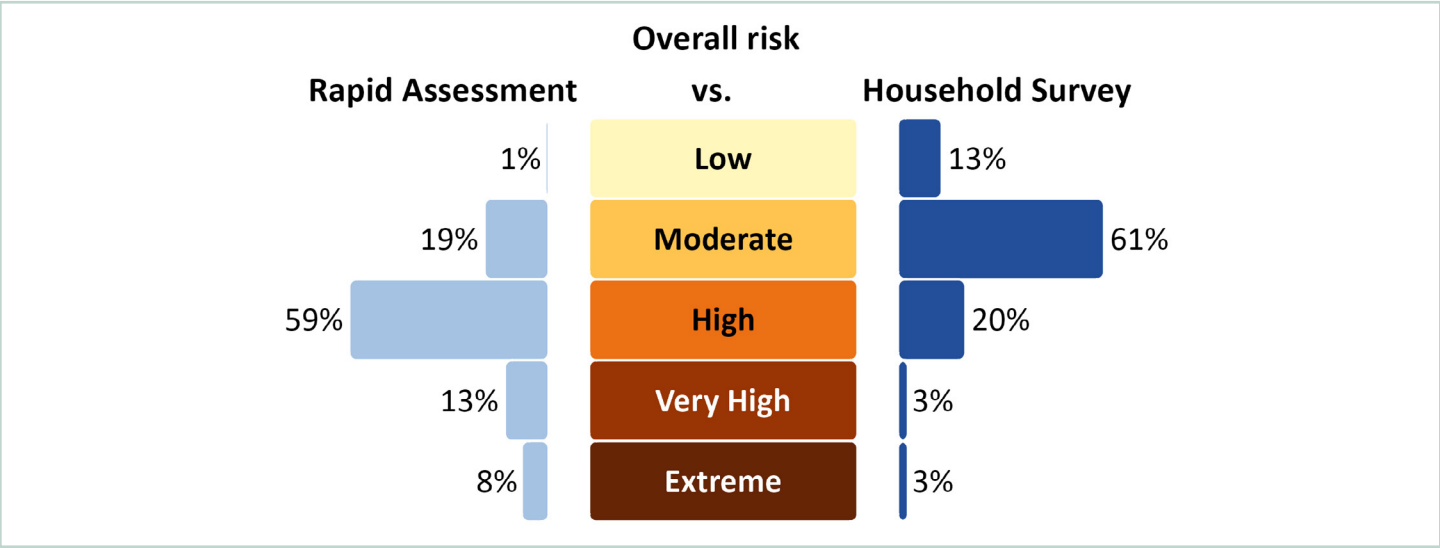

Figure 4—Distribution of overall risk rating. Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. Represents 156 paired household survey and WiRē RA data.

Home ignition potential—

Wildfire conditions provide various opportunities for igniting structures by either embers or exposure to flames. These conditions test the limits of the materials used in construction. Both the design and building materials play a role in a structure's ignitability.

Risk attribute: roof—

The roofing material of a structure is a critical component in determining ignitability. Roofs were assessed based on the material from which they were constructed. These were either fire-resistant (non-combustible) materials such as metal, tile, and asphalt, or fire-receiving (combustible) materials such as wood shingles.

The WiRē RA data (96%) and survey responses (98%) were in accordance that most roofs were made of non-combustible materials. However, the WiRē RA data had more roofs in the combustible roof category (4%) than the survey response data (2%) (refer to fig. 5).

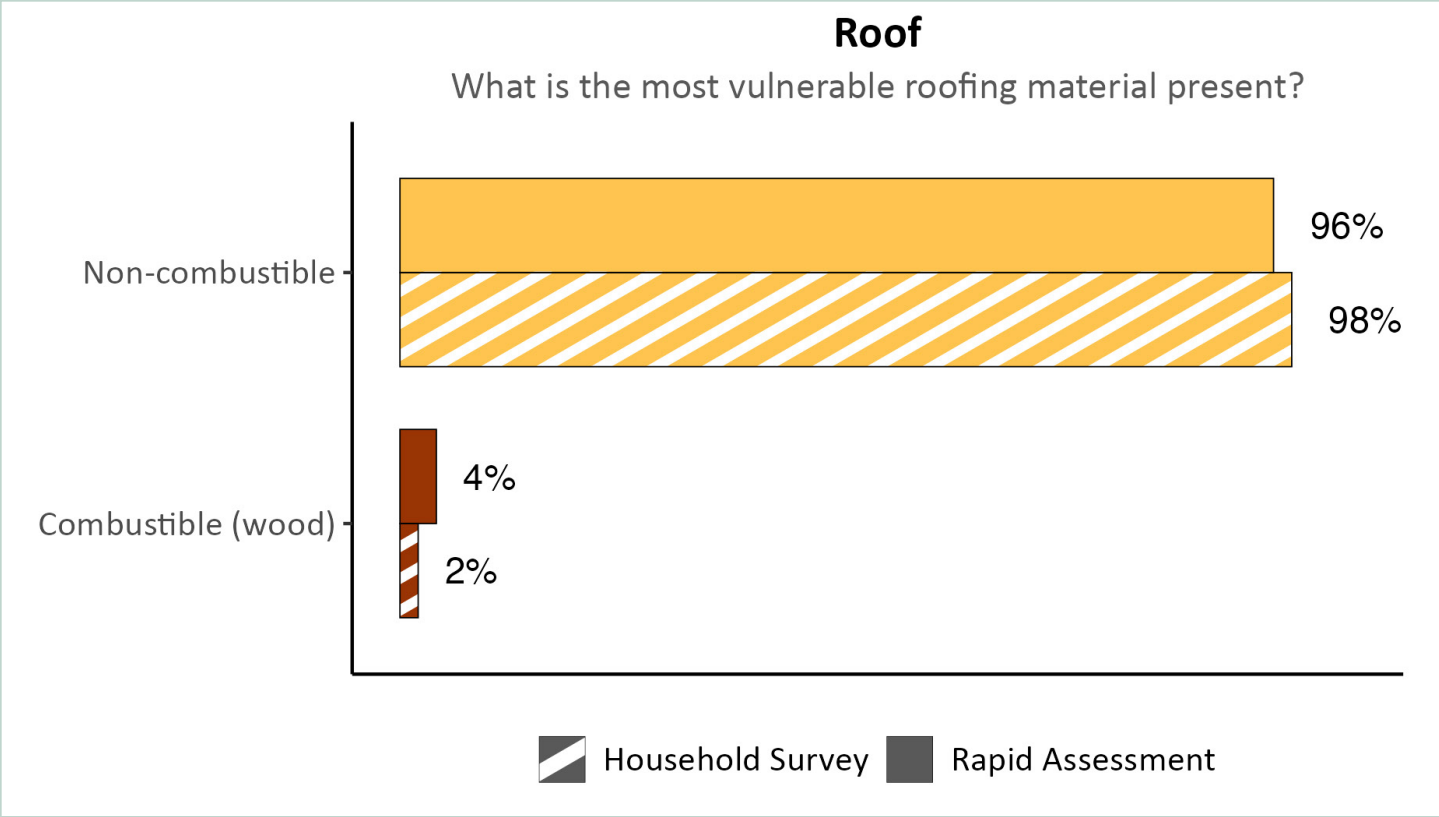

Figure 5—Combustibility of residential roof type. Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. N = 156 responses to this survey question.

Risk attribute: siding—

A structure's exterior walls, including the materials used and the design and construction, contribute to the overall ignitability of a home in a wildfire event. Smooth, non-combustible materials such as stucco and metal have less chance of collecting blowing embers than unmaintained wood siding, which may have more space for embers to land. The siding of homes was assessed into three categories: low risk, non-combustible materials (stucco, brick, stone); medium combustion risk materials (log, heavy timbers, maintained wood); or high combustion risk materials (vinyl, unmaintained wood, or other ember-receptive siding).

Trained assessors categorized the exterior siding of most homes as log or heavy timbers (47%), a finding consistent with survey responses, in which most respondents (63%) reported the same. However, while trained assessors reported that 42 percent of homes had wood or vinyl siding, 16 percent of survey respondents identified these materials as their home's siding. The WiRē RA data and survey responses also differed in the non-combustible siding material category, reporting 10 percent and 21 percent, respectively (refer to fig. 6).

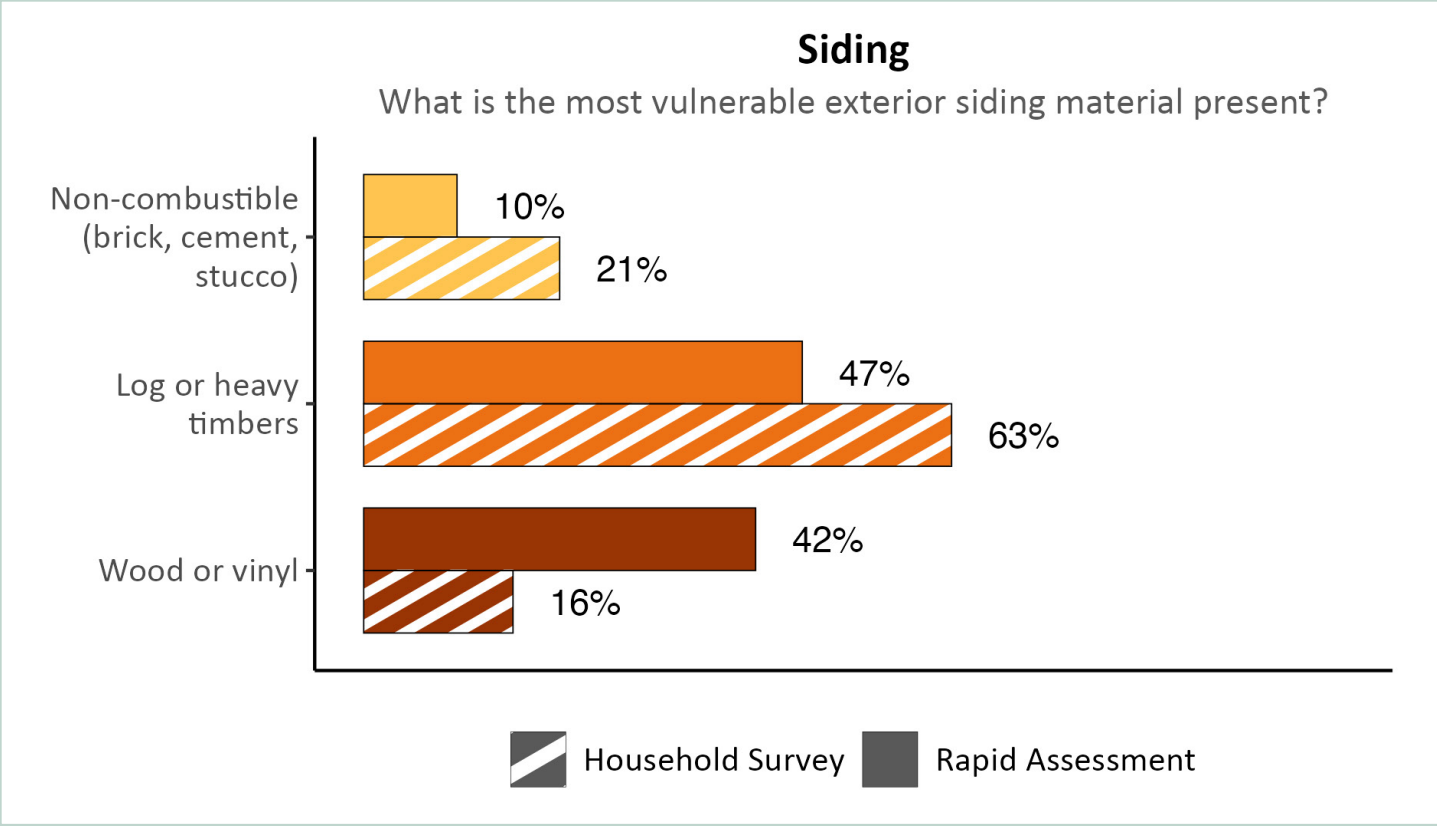

Figure 6—Residential exterior siding type, categorized by material into low, medium, and high-risk categories. Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. N = 154 responses to this survey question.

Risk attribute: combustible attachments—

Attachments to structures (e.g., wooden decks, fences) increase the area exposed to blowing embers in a wildfire event and have the potential to provide a path, once ignited, to the structure. Parcels were assessed on the presence or absence of combustible attachments, including a combustible balcony, deck, porch, and fence.

Trained assessors observed the presence of combustible attachments on almost all homes (99%). Most survey respondents (82%) also reported the presence of combustible attachments. Although, more survey respondents (18%) indicated the absence of combustible attachments compared to the WiRē RA (1%) (refer to fig. 7).

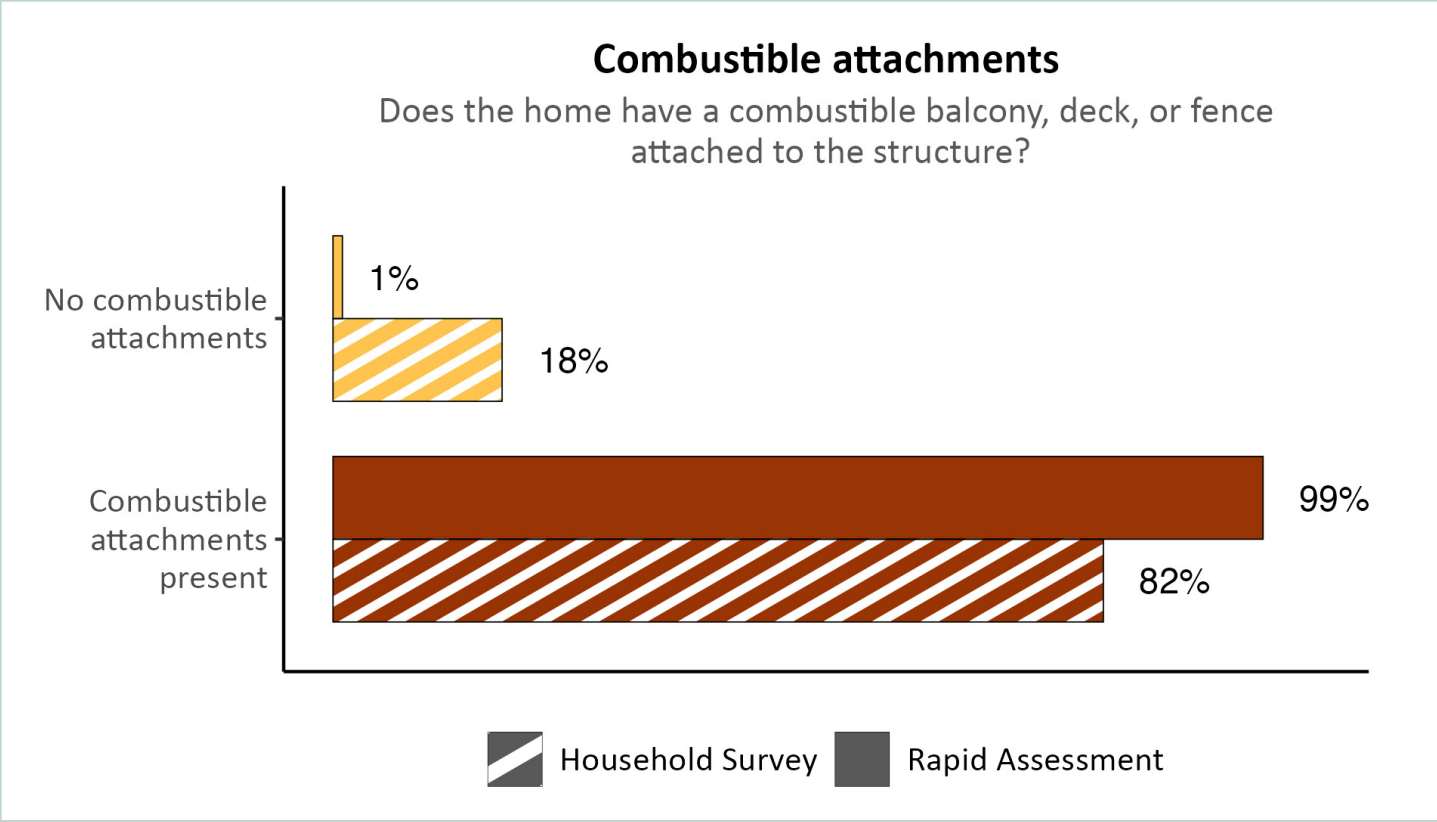

Figure 7—Presence or absence of combustible attachments. Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. N = 156 responses to this survey question.

Risk attribute: proximity to adjacent homes—

Home-to-home ignitions (i.e., conflagration) are a significant factor in the spread of fire through more densely built environments. Homes and structures built with combustible materials are more susceptible to wildfire ignitions. If they are located in close proximity to each other, they are more likely to result in home-to-home ignition. In conflagration events, homes are both the recipients and drivers of fire. Parcels were assessed on the proximity of homes to nearby structures.

The WiRē RA and household survey data follow a similar pattern for the distance to neighboring homes, with some slight differences appearing in two categories: greater than 100 feet and 10 to 29 feet. Nearly half of survey respondents (49%) reported having more than 100 feet from their home to a neighboring home, whereas the WiRē RA data indicated that 32 percent of homes had this much distance. Another notable difference appears in the 10 to 29-foot range, where the WiRē RA data indicates nearly twice the percentage (21%) compared to the survey data (12%). Trained assessors and survey respondents were most closely aligned in the 30 to 100-foot category (41% and 37%, respectively) and the less-than-10-foot category (6% and 2%, respectively) (refer to fig. 8).

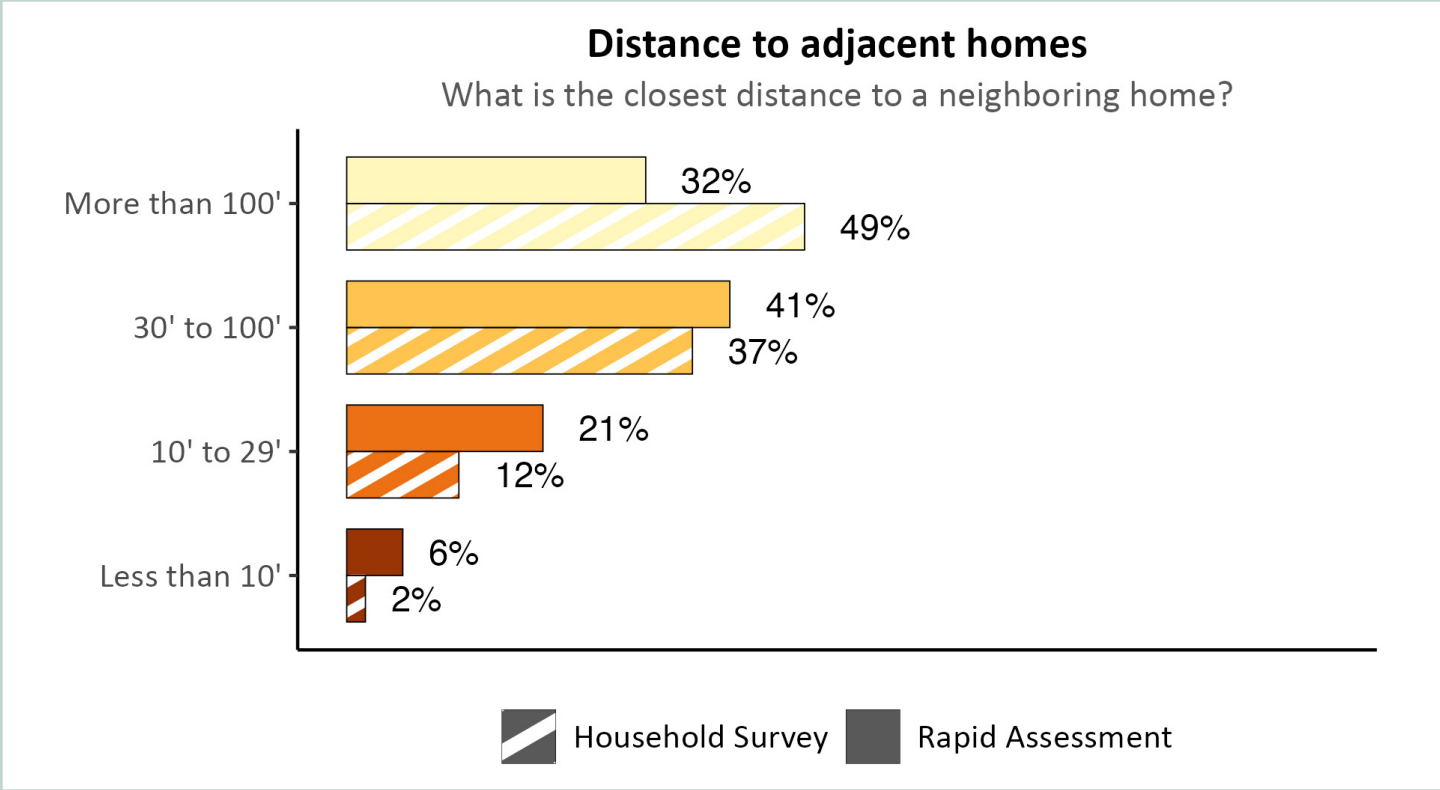

Figure 8—Proximity to adjacent homes, categorized by closest distance to neighboring home. Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. N = 155 responses to this survey question.

Defensible space—

Home ignition is affected by the presence of, or direct contact with, vegetation and other combustible materials which can ignite and transfer flames to the home itself. Additionally, vegetation and combustible materials around the home influence fire behavior and firefighters' ability to access and defend the home (e.g., a canopy fire in a densely treed area around the home is more difficult to suppress than a fire on the ground).

Risk attribute: distance to overgrown vegetation—

Fuels within 100 feet of the home increase the risk of wildfire damage. Particularly flammable or abundant vegetation near the home may ignite and spread fire to the home. Distance to overgrown vegetation (also referred to in earlier versions of the assessment as "defensible space") was assessed by the proximity of the home to vegetation categorized as overgrown, dense, or unmaintained.

The survey responses and WiRē RA data were misaligned on this attribute. Trained assessors observed that more than half (55%) of homes had 5 to 29 feet of distance to overgrown, dense, or unmaintained vegetation, whereas 17 percent of survey respondents placed their homes in this category. Trained assessors also reported that 38 percent of homes had less than 5 feet of distance, compared to 3 percent of survey respondents. In contrast, most survey respondents reported having 30 to 100 feet (41%) or more than 100 feet (39%) of distance from their home

to overgrown vegetation. However, trained assessors did not report any homes with more than 100 feet distance (refer to fig. 9).

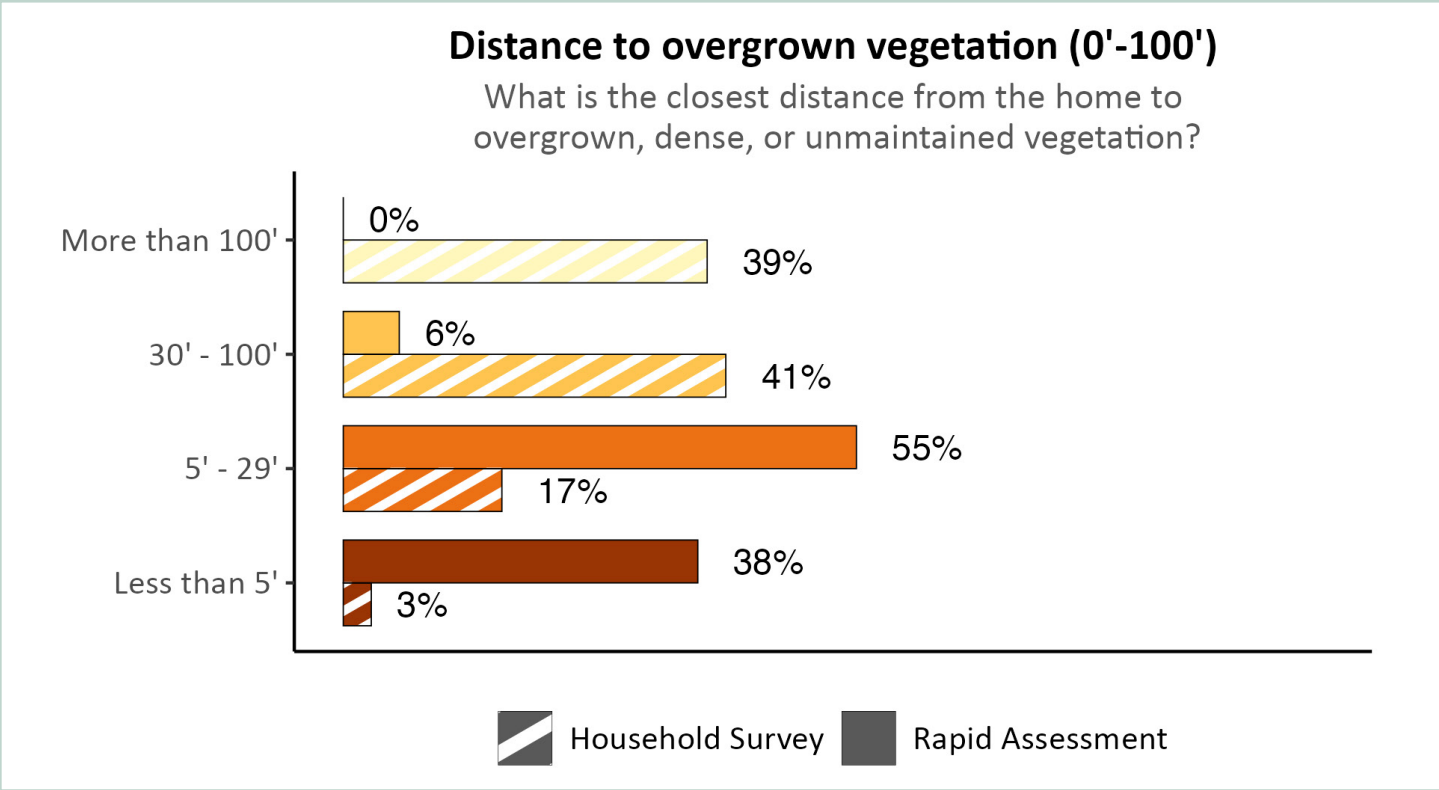

Figure 9—Distance to overgrown vegetation, categorized by distance between the home and overgrown, dense, or unmaintained vegetation. Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. N = 155 responses to this survey question.

Risk attribute: other combustibles—

In addition to vegetation, defensible space includes the presence of other combustible materials within 30 feet of the home such as lumber, firewood, a propane tank, flammable outdoor furniture, or other materials that could easily ignite, including an outbuilding/shed, detached garage, or other structure on the property.

The survey responses and WiRē RA data did not align on this attribute. Trained assessors observed that about two-thirds (68%) of homes had less than 5 feet of distance to non-vegetative combustible items, whereas 13 percent of survey respondents placed their homes in this category. Additionally, as compared to the WiRē RA data, survey respondents overestimated their homes' distance to non-vegetative combustibles. Forty-seven percent of respondents reported non-vegetative combustibles 5 to 30 feet from their home and 40 percent reported no combustible items at all or combustible items more than 30 feet from the home. In contrast, WiRē RA data showed 20 percent and 12 percent of homes in these categories, respectively (refer to fig. 10).

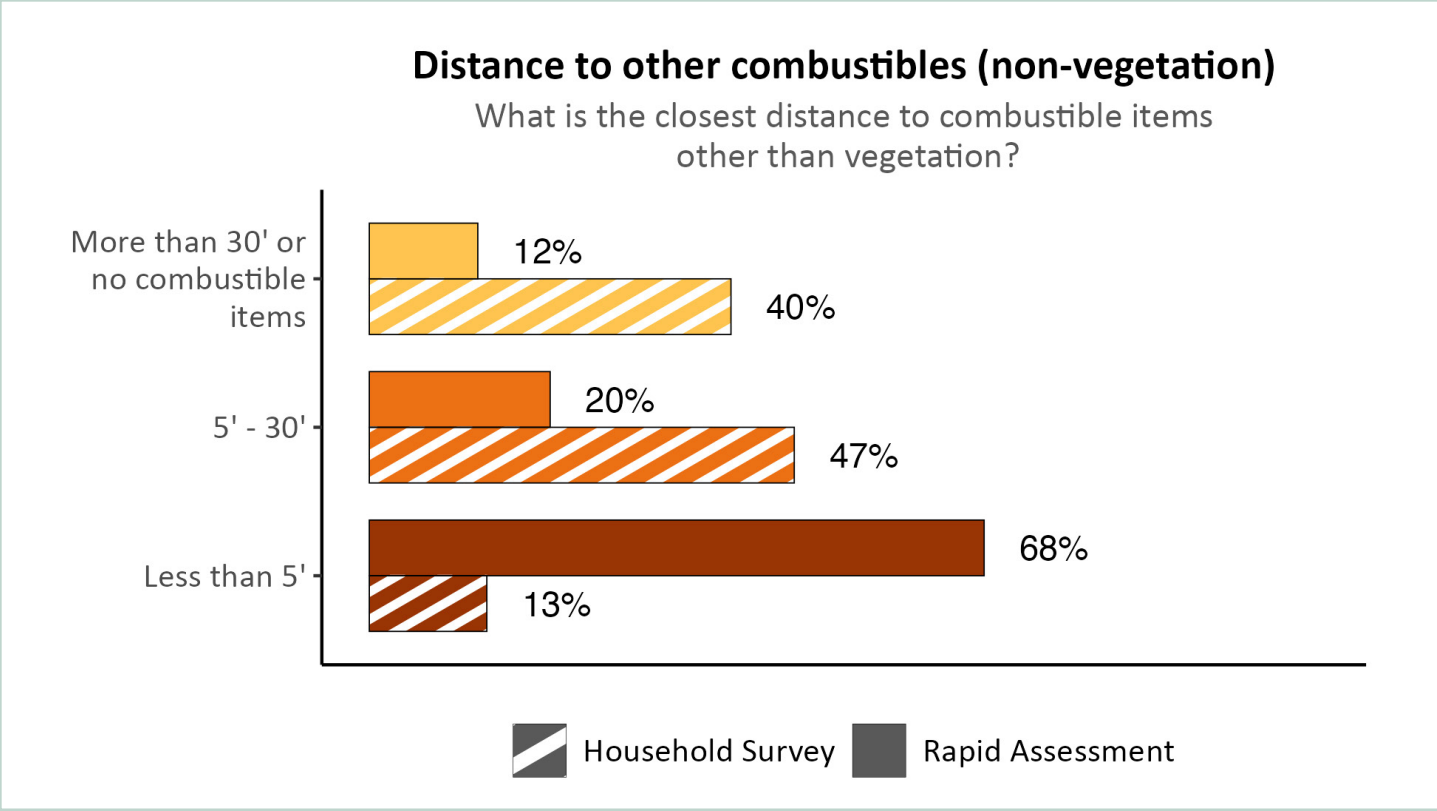

Figure 10—Other combustible materials, categorized by closest distance from home to combustible items other than vegetation. Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. N = 156 responses to this survey question.

Background conditions—

Background conditions may vary from parcel to parcel within communities, creating unique levels of risk for each home. Such conditions include dangerous topography (ridge, steep drainage, or narrow canyon), overall slope of the property within 150 feet of the home, and the type and density of surrounding vegetation between 100 and 150 feet of the home. These are further described below.

Risk attribute: distance to dangerous topography—

Wildfire behavior is influenced by topography. Features that can facilitate increased fire behavior (e.g., rate of spread, intensity) such as drainages, narrow canyons, and ridges are considered when assessing topography. Properties were assessed into categories that measure the home's distance from steep or dangerous topography at distances of less than 50 feet, 50 feet to 150 feet, and over 150 feet.

WiRē RA and household survey data were largely in alignment on this risk attribute, with both trained assessors (98%) and most survey respondents (89%) reporting more than 150 feet of distance from their homes to a ridge, steep drainage, or narrow canyon. However, a higher percentage of survey respondents reported having 50 to 150 feet (6%) or less than 50 feet (5%) of distance to dangerous topography compared to trained assessors (1% for both categories) (refer to fig. 11).

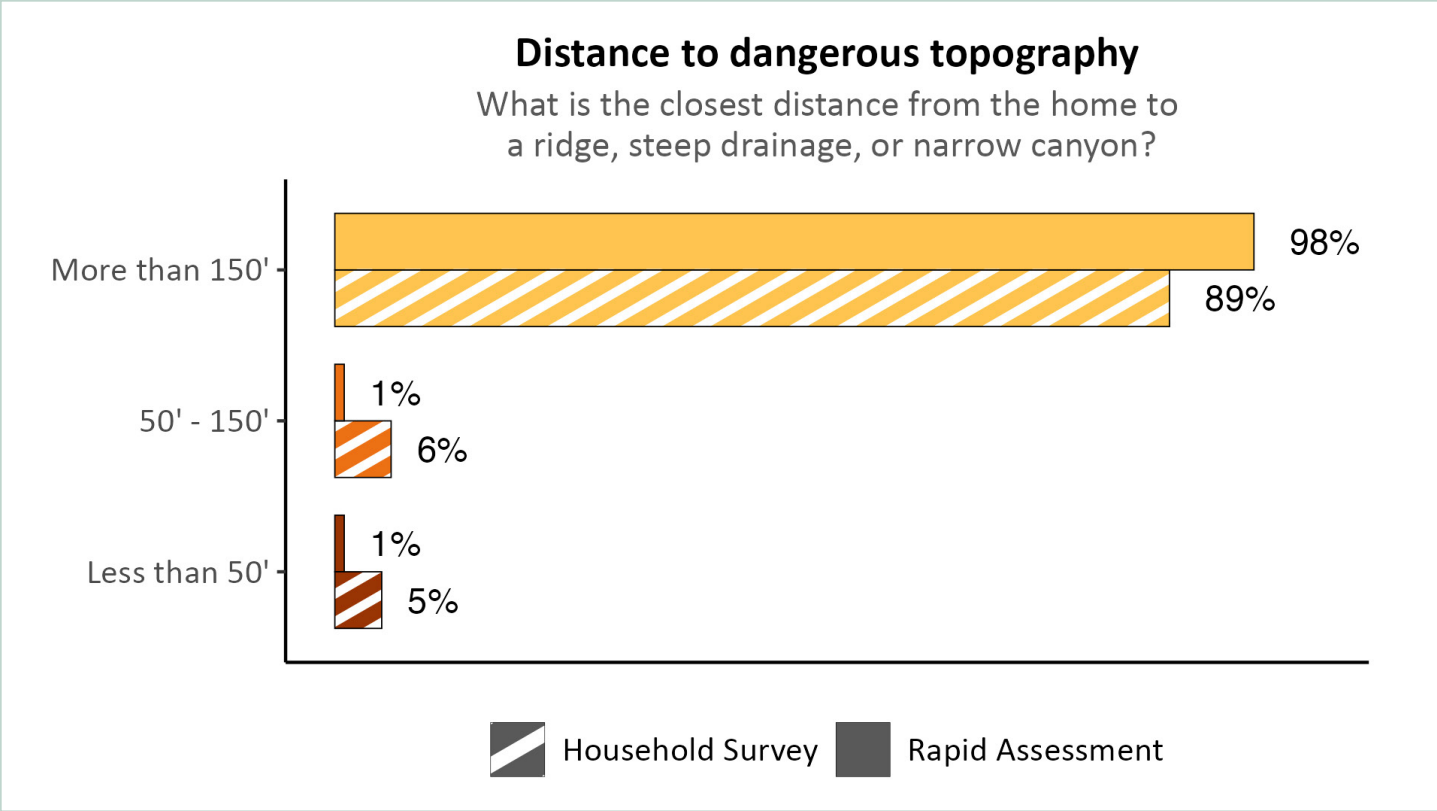

Figure 11—Closest distance from the home to dangerous topography (e.g., a ridge, steep drainage, or narrow canyon). Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. N = 154 responses to this survey question.

Risk attribute: slope—

Slope is an additional factor that influences wildfire behavior and response. For example, steep terrain can increase the rate of wildfire spread. Additionally, firefighters and their equipment may be hindered by uneven topography.

WiRē RA and household survey data were largely similar for the slope attribute, with most parcels classified as having a gentle slope (less than 20%) by both trained assessors (94%) and survey respondents (72%). However, a higher percentage of survey respondents (25%) reported their property's slope as moderate (20% to 45%) compared to trained assessors (6%) (refer to fig. 12).

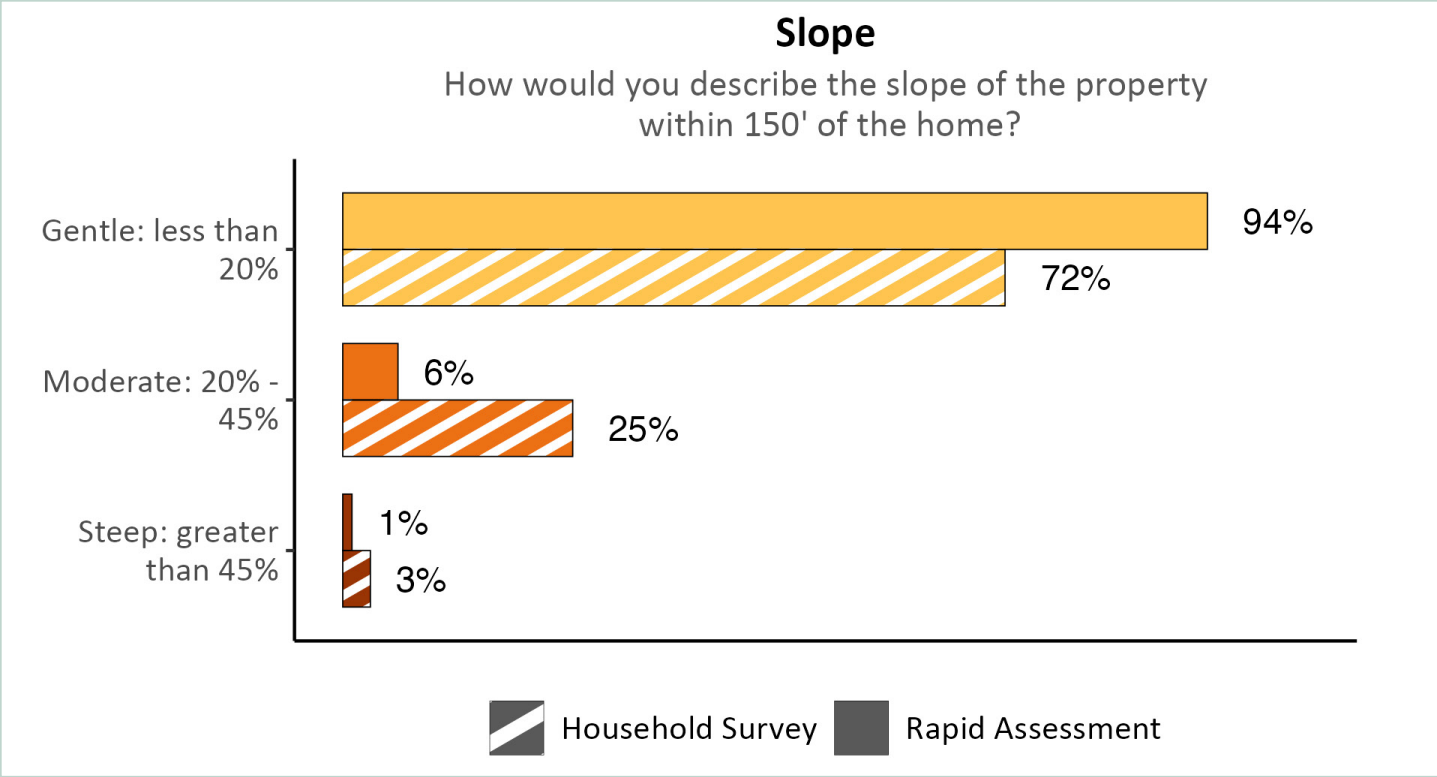

Figure 12—Overall slope of property. Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. N = 157 responses to this survey question.

Risk attribute: adjacent fuels—

Vegetation surrounding the home beyond the defensible space zone is another factor in determining wildfire behavior. Properties were assessed on the dominant vegetation type present between 100 feet and 150 feet from the home, regardless of whether this falls within the property boundary. Three categories of vegetation are used: light (grasses with isolated brush), medium (sparce brush and/or isolated trees), and dense (dense brush and/or dense trees).

Results indicate a discrepancy between survey respondents and trained assessors in their assessment of the dominant vegetation density between 100 and 150 feet from the home. Most survey respondents (70%) classified the dominant vegetation as medium density, whereas trained assessors found that 4 percent of properties fell into this category. In contrast, trained assessors observed that the majority of properties (94%) had dense vegetation, while 23 percent of survey respondents reported the same (refer to fig. 13).

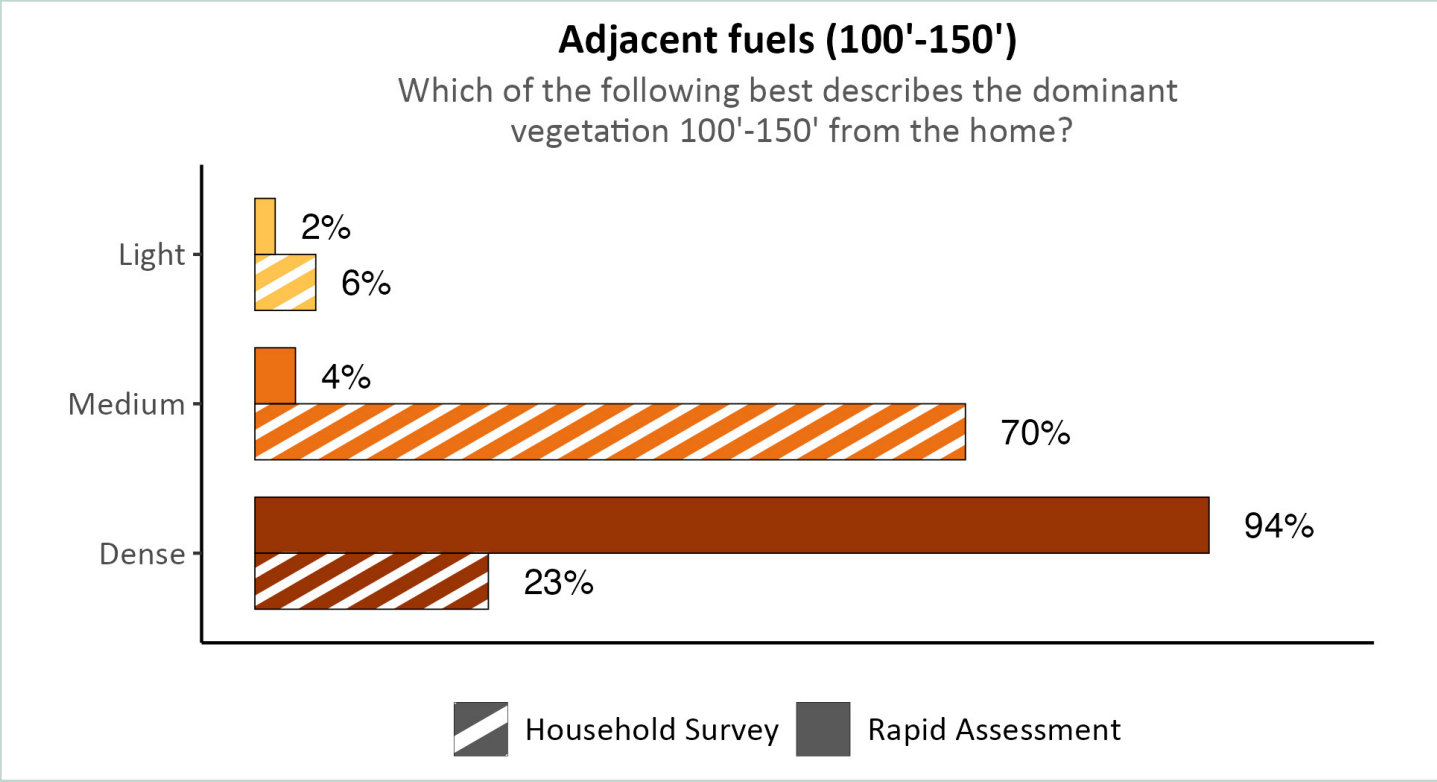

Figure 13—Adjacent fuels, categorized by the density of dominant vegetation 100 to 150 feet from the home. Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. N = 155 responses to this survey question.

Access—

During a wildfire, residents must have evacuation route options and emergency responders must be able to safely identify and access properties. The following four attributes describe access for both residents and emergency responders in terms of home identification, evacuation routes, and parcel accessibility by way of a driveway.

Risk attribute: address posting—

The visibility of home addresses in various conditions of smoke and daylight is critical for swift and safe response. Properties' addressing conditions are assessed based on local standards of signage that are posted and visible from the primary road.

Local standards for property address postings: posting the address at the end of the driveway, using reflective signage, displaying 4-inch numerals on a contrasting background, and using non-combustible materials.

Survey respondents reported either having visible address signs that did not meet all standards (47%) or not having posted or visible addresses (39%). However, the trained assessors found that most properties (68%) had visible address postings, but that the signs did not meet all standards. Additionally, trained assessors observed that 1 percent of properties had address postings that fully met all standards, whereas 14 percent of survey respondents reported the same (refer to fig. 14).

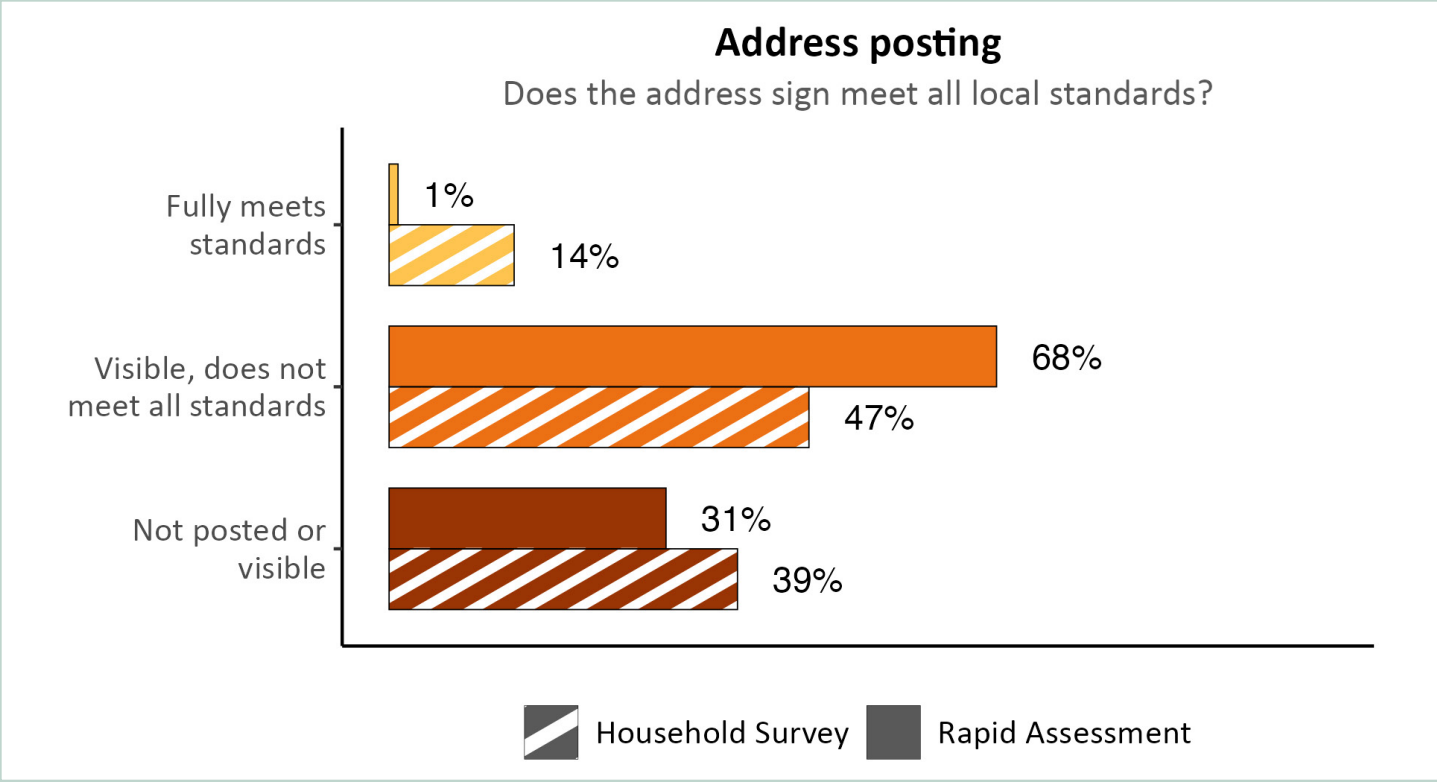

Figure 14—Characteristics of property address. Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. N = 151 responses to this survey question.

Risk attribute: evacuation routes for ingress/egress—

Resident evacuation options and safe routes for emergency responders to access properties are critical. This access is dictated by existing road systems within communities. Wildfire conditions may block evacuation routes, limiting residents' ability to safely evacuate. Thus, properties are evaluated based on having two (or more) roads in and out.

Trained assessors and survey respondents largely agreed on ingress and egress evacuation routes. Both trained assessors and survey respondents reported that most properties (69% and 61%, respectively) had two or more roads in and out of the community. However, trained assessors found that fewer properties (31%) had only one access road compared to survey respondents (39%) (refer to fig. 15).

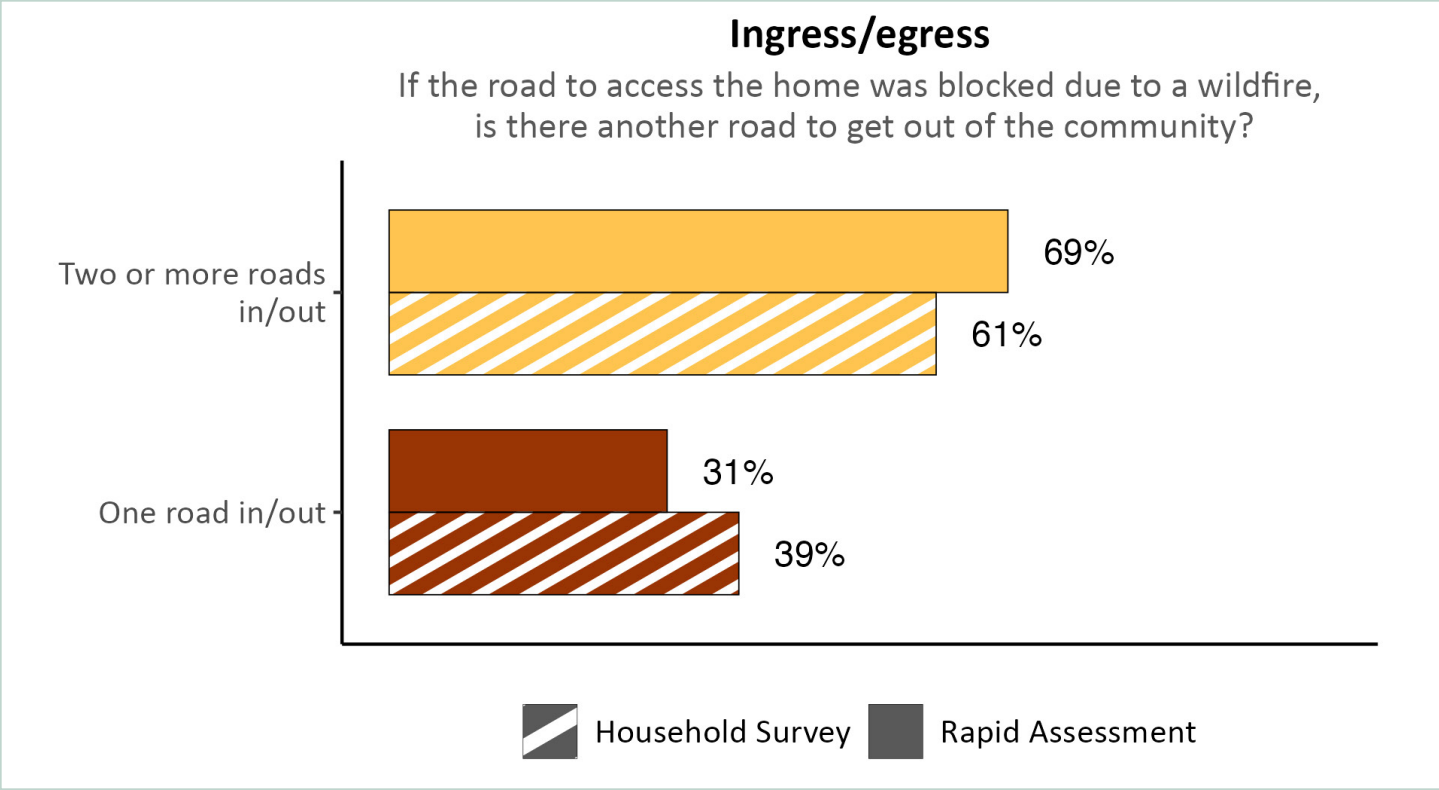

Figure 15—Number of evacuation routes in or out of community. Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. N = 156 responses to this survey question.

Risk attribute: driveway clearance—

Emergency vehicles must be able to easily access and quickly exit a property. This ability can be affected by a driveway's width, length, and presence or lack of a turnaround, as well as narrow gates or low hanging tree branches. Driveway clearance is assessed based on height and width and is reported as meeting both standards, meeting one standard but not the other, or not meeting either standard. To meet all clearance standards, the driveway must be at least 13.5 feet in height and 20 feet in width.

According to survey responses (62%) and WiRē RA data (82%), most driveways met all standards. However, while more than a quarter of survey respondents (32%) reported that their driveway met one but not both standards, trained assessors observed this in 12 percent of driveways. Both trained assessors and survey respondents (6% each) agreed on driveways that did not meet either standard (refer to fig. 16).

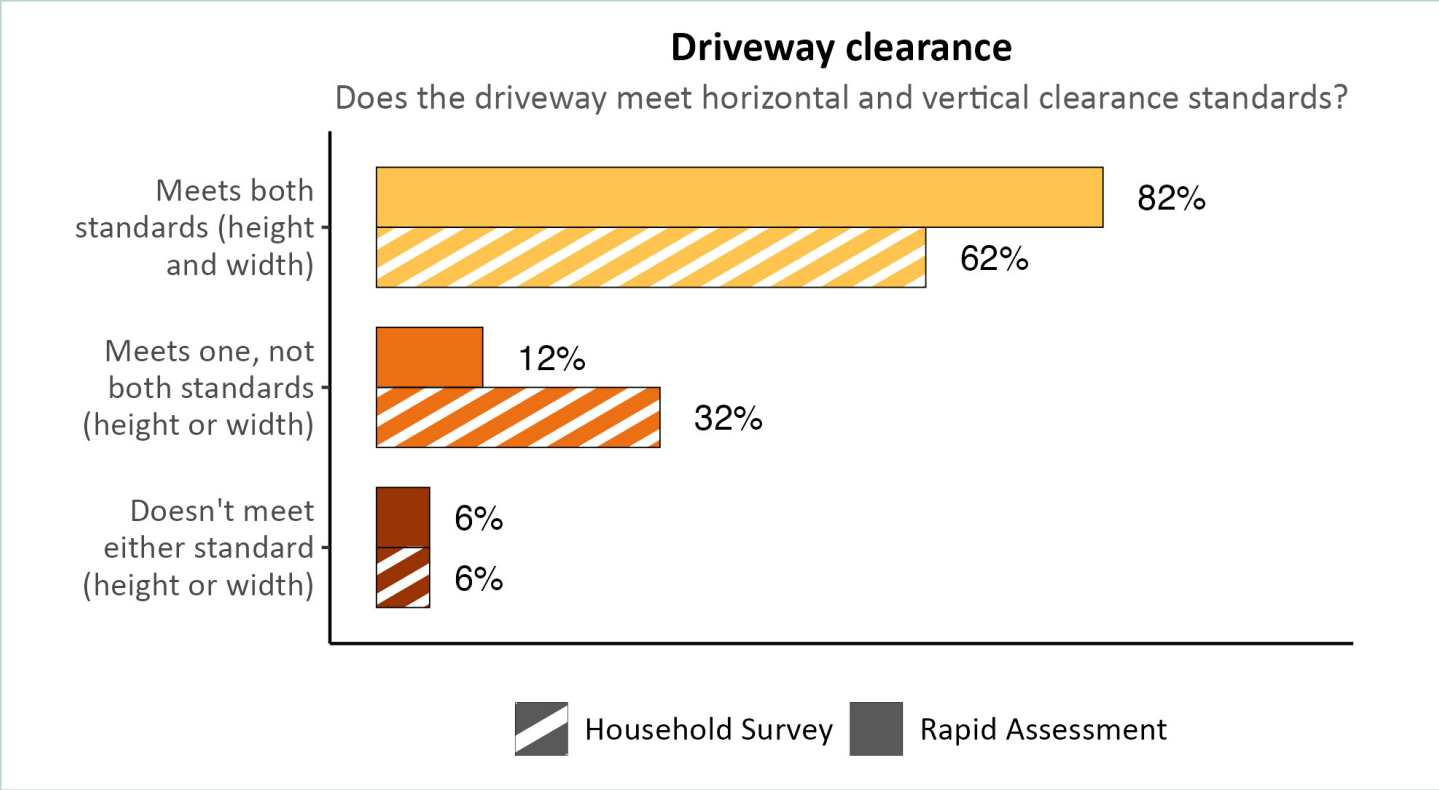

Figure 16—Width of residence driveway at its narrowest point. Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. N = 146 responses to this survey question.

Risk attribute: driveway length—

Similar to driveway clearance, the length of a driveway also affects the ability of fire engines to turn around and safely respond to wildfire. The WiRē RA distinguishes between properties with driveways that are less than 150 feet long, driveways that are 150 feet or more with adequate turnaround space (e.g., suitable for a Type 1 engine), and driveways 150 feet or more without adequate turnaround space.

A majority of survey respondents (79%) described their driveways as being less than 150 feet, while trained assessors found that 50 percent of the assessed homes had driveways of this length. WiRē RA data indicated that the percentage of homes with driveways of 150 feet or more with adequate turnaround space (33%) was more than twice the survey-reported percentage (15%). Additionally, the WiRē RA data showed that the percentage of homes with driveways of 150 feet or more without adequate turnaround space (17%) was nearly three times the survey-reported percentage (6%) (refer to fig. 17).

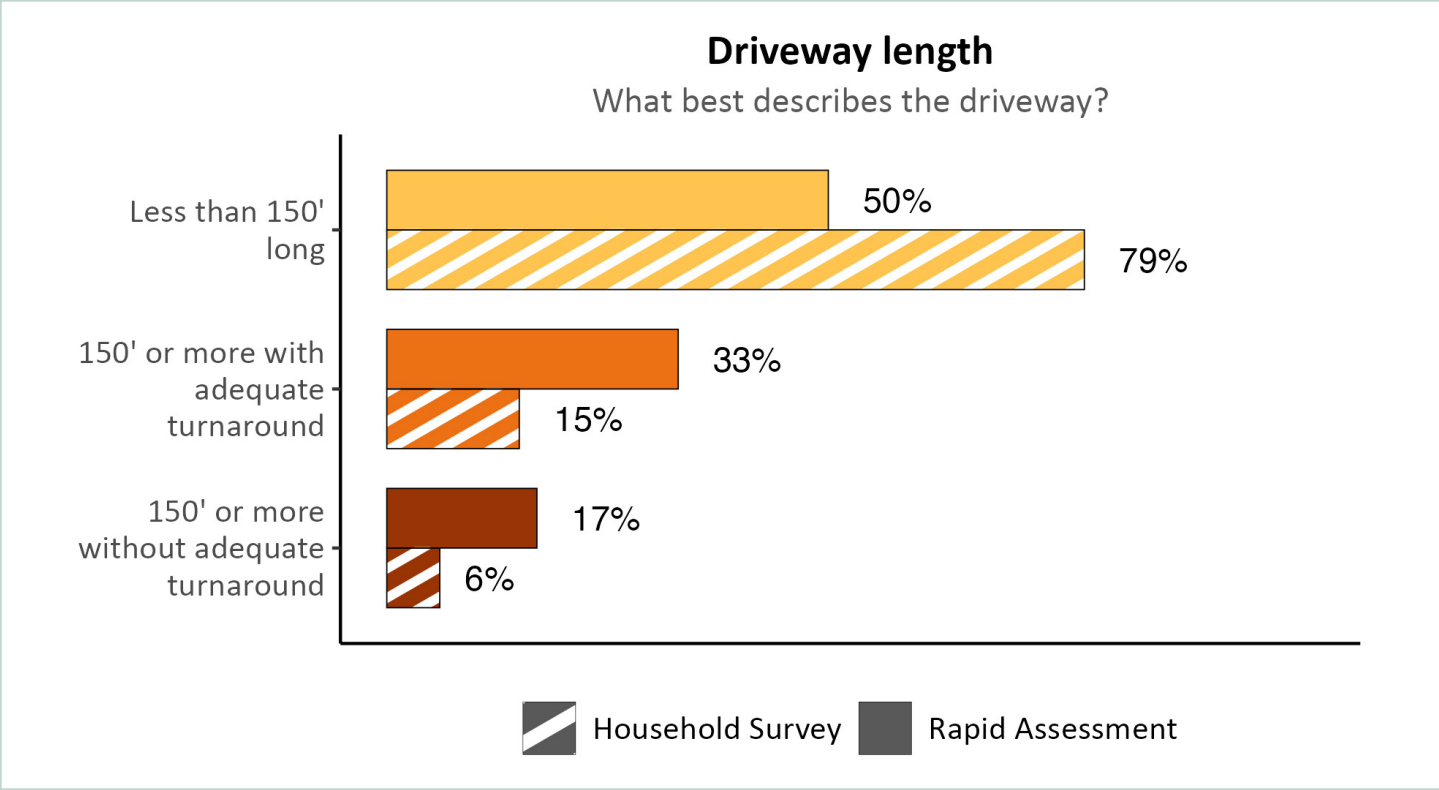

Figure 17—Driveway length and presence of turnaround. Comparison of household survey data as reported in 2023 by survey respondents in the Lake County, Colorado, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) data. N = 149 responses to this survey question.

Social Dimensions of Wildfire Risk in Lake County: Results of the Household Survey

In this section, we present the results of the remaining data collected from the household survey to demonstrate the social dimensions of wildfire in this unique study area (refer to Appendix E for household survey questions and responses). The results presented here include all available household survey data from the 160 completed surveys.

Demographics

Most survey respondents (78%) occupied their home in Lake County year-round, while 19 percent resided there for less than 12 months a year. The average year that homes in the study area were built was 1988, and the average year that the survey respondents moved into their homes was 2006 (refer to Appendix E). At the time of purchasing or beginning to rent their Lake County home, 43 percent of survey respondents reported being very aware of the wildfire risk, 41 percent were somewhat aware, and 12 percent were unaware (refer to fig. 18).

Survey respondents identified as either male (50%) or female (50%), with an average age of 60 years. Three quarters (75%) held a bachelor's degree or higher, and of those, 36 percent had an advanced degree (e.g., M.D., M.A., M.S., Ph.D.). Forty-four percent of survey respondents were retired, 43 percent worked full-time, 11 percent worked part-time, and 3 percent were unemployed or did not work outside of the home. More than half (53%) reported an annual household income of $100,000 or greater, while 15 percent reported $75,000 to $99,999,

15 percent reported $50,000 to $74,999, 9 percent reported $25,000-$49,999, and 7 percent reported less than $24,999 (refer to Appendix E).

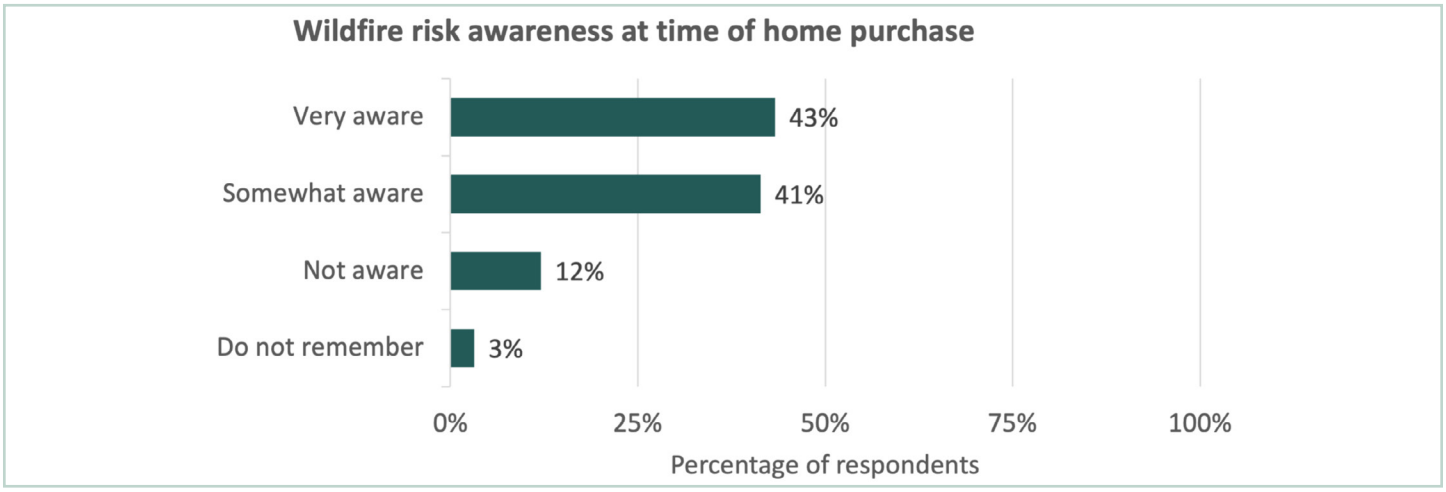

Figure 18—Respondents' awareness of wildfire risk, when they bought or began renting their home, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 157 respondents to this survey question.

Experience with Wildfire and Risk Perceptions

Experience with wildfire—

Almost all respondents had no experience with wildfire at their Lake County home. In each category, 1 percent of survey respondents reported having evacuated, had smoke damage, had fire damage, or had their residence destroyed by fire (refer to fig. 19).

One percent of survey respondents reported having had wildfire on their property, while another 1 percent experienced a wildfire less than two miles away but not on their property. Twenty-six percent indicated that the closest distance a wildfire had come to their property was between 2 and 10 miles, while 44 percent reported a distance of more than 10 miles away (refer to fig. 20).

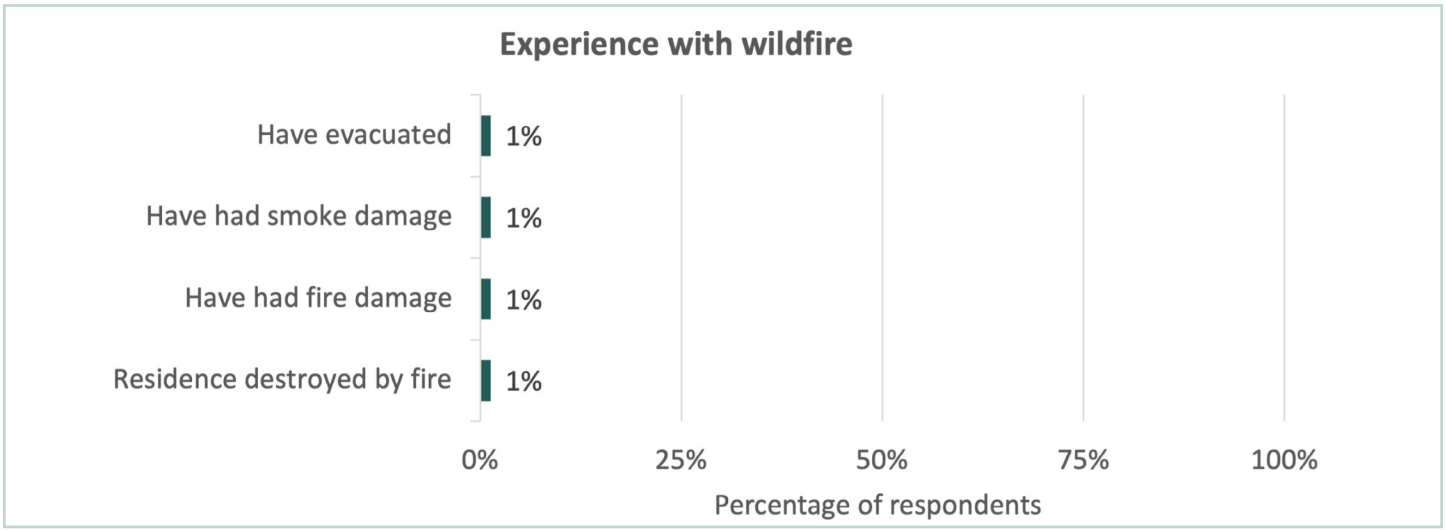

Figure 19—Respondent experience with various impacts of wildfire, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 158 respondents to these survey questions.

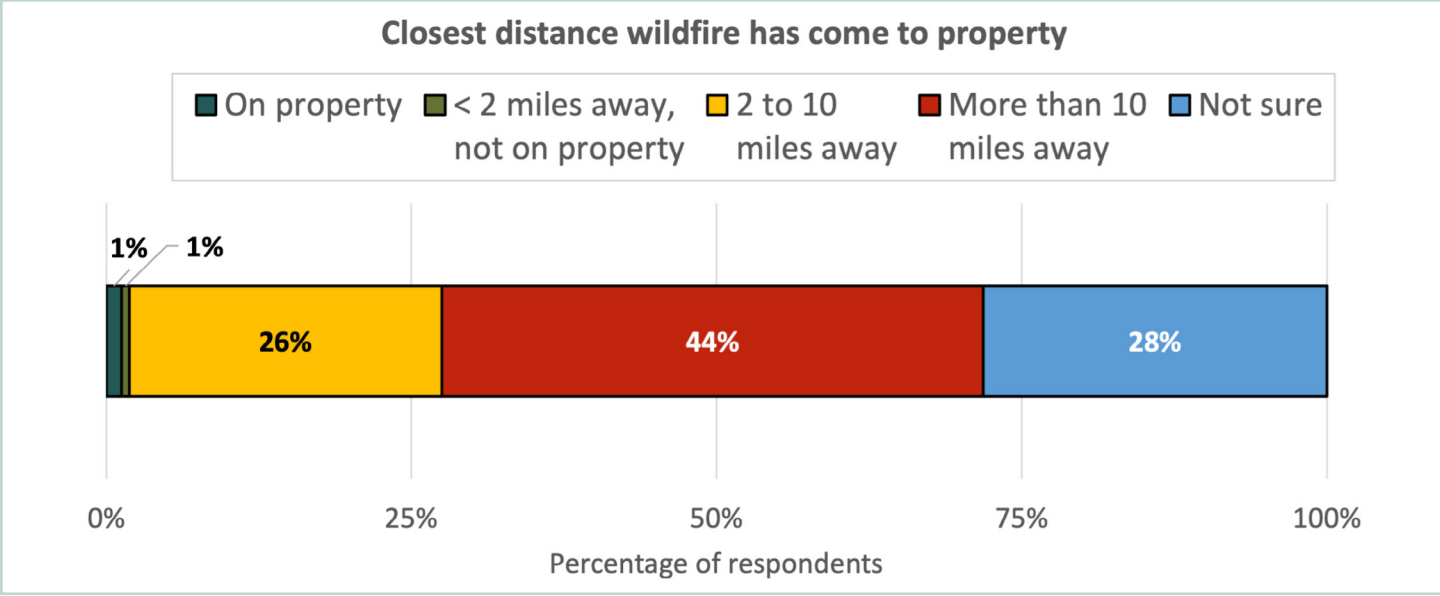

Figure 20—Respondent estimates of how close a wildfire has come to their property, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 160 respondents to this survey question.

Perceptions of risk—

Survey respondents were asked to consider the likelihood of the occurrence of wildfire on their property and potential outcomes if one were to occur. Sixty-six percent agreed or strongly agreed with the statement, "My property is at risk of wildfire." However, no survey respondents agreed or strongly agreed with the statement, "I plan to move out of the area in the next 12 months because of wildfires" (refer to fig. 21).

Survey respondents were also asked about their expectations regarding the likelihood of a wildfire on their property within the next year. Seventeen percent of respondents believed there was a 50 percent or greater chance of a wildfire occurring on their property. However, if a wildfire were to occur on their property within the next year, 66 percent of respondents thought it was likely (50% or greater chance) that they would lose their home (refer to fig. 22).

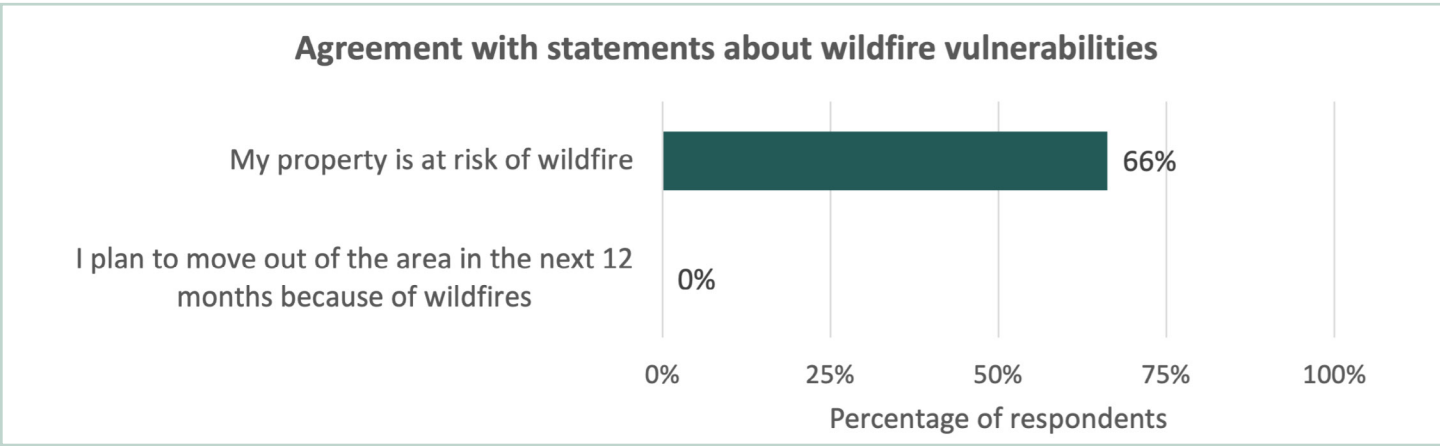

Figure 21—Agreement ("agree" or "strongly agree") with statements about whether wildfire threatens the respondent's property and whether they plan to move in the next 12 months because of wildfire, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 157 and 158 respondents to the two survey statements listed, respectively.

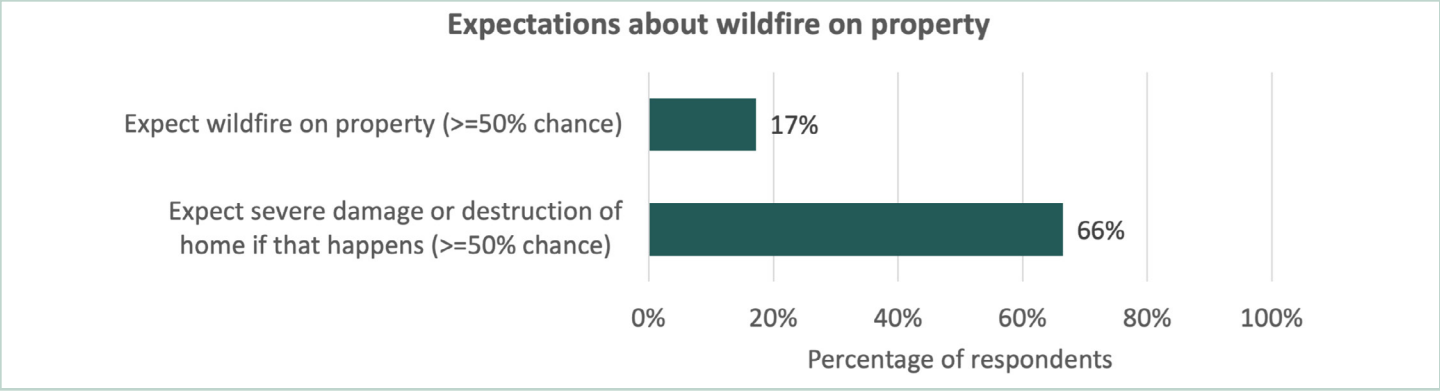

Figure 22—Estimate of the chances (50% or greater chance) of a wildfire on their property in the next year, and chances (50% or greater chance) of losing their home in that case, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 151 and 152 respondents to the two survey statements listed, respectively.

When asked who would protect their home in the event of a wildfire, 20 percent of survey respondents believed it was extremely or very likely that the fire department would save their home. Sixteen percent of respondents thought it was extremely or very likely that they would be able to put out the fire themselves (refer to fig. 23).

Regarding potential outcomes, 67 percent of respondents reported that it was extremely or very likely their home would experience smoke damage in the event of a wildfire on their property, while 65 percent believed it was extremely or very likely that their trees and landscapes would burn. More than half (59%) of respondents thought it was extremely or very likely that their home would sustain some physical damage. Notably, a higher percentage of respondents (46%) believed it was extremely or very likely that their neighbors' homes would be damaged or destroyed, compared to those who thought their own home would be destroyed (31%). Twenty-two percent of respondents thought they would lose money due to loss of business or income (refer to fig. 24).

Survey respondents indicated some understanding of the physical mechanisms of home ignition. When asked how likely it was that certain ignition sources would cause their home to catch fire if a wildfire were on their property, 48 percent of respondents believed it was extremely or very likely that their home would ignite from direct flames, 40 percent thought it was extremely or very likely that embers would ignite their home, and 30 percent considered ignition from nearby burning homes to be extremely or very likely (refer to fig. 25).

Most respondents recognized major sources of wildfire risk. When asked about factors that contribute to the likelihood of a wildfire damaging their Lake County property in the next 12 months, 82 percent believed that the vegetation on nearby public or large undeveloped land would contribute somewhat or a lot, while 80 percent thought the same about vegetation on their neighbors' properties. Additionally, 79 percent identified vegetation on their own property, 77 percent cited the physical characteristics of their house or other buildings, and 66 percent pointed to the lack of a nearby water supply for fire suppression as factors that contributed somewhat or a lot (refer to fig. 26).

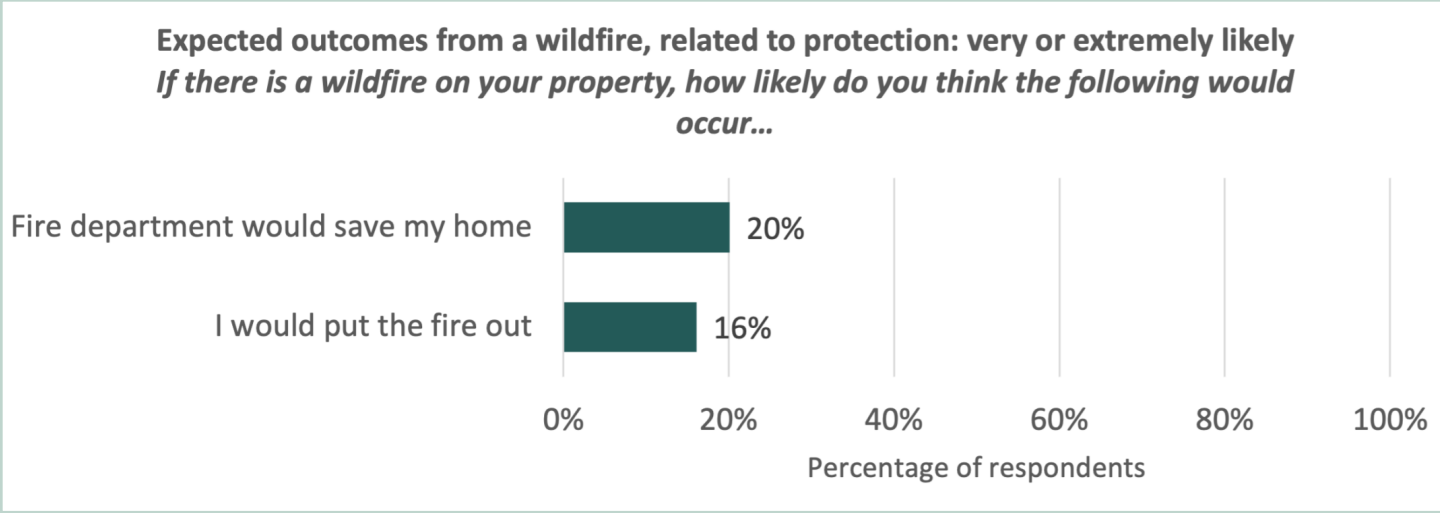

Figure 23—Percentage of respondents who thought the above source of protection to their home were very or extremely likely, in the event of a wildfire on their property, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 154 and 155 respondents to each survey statement listed, respectively.

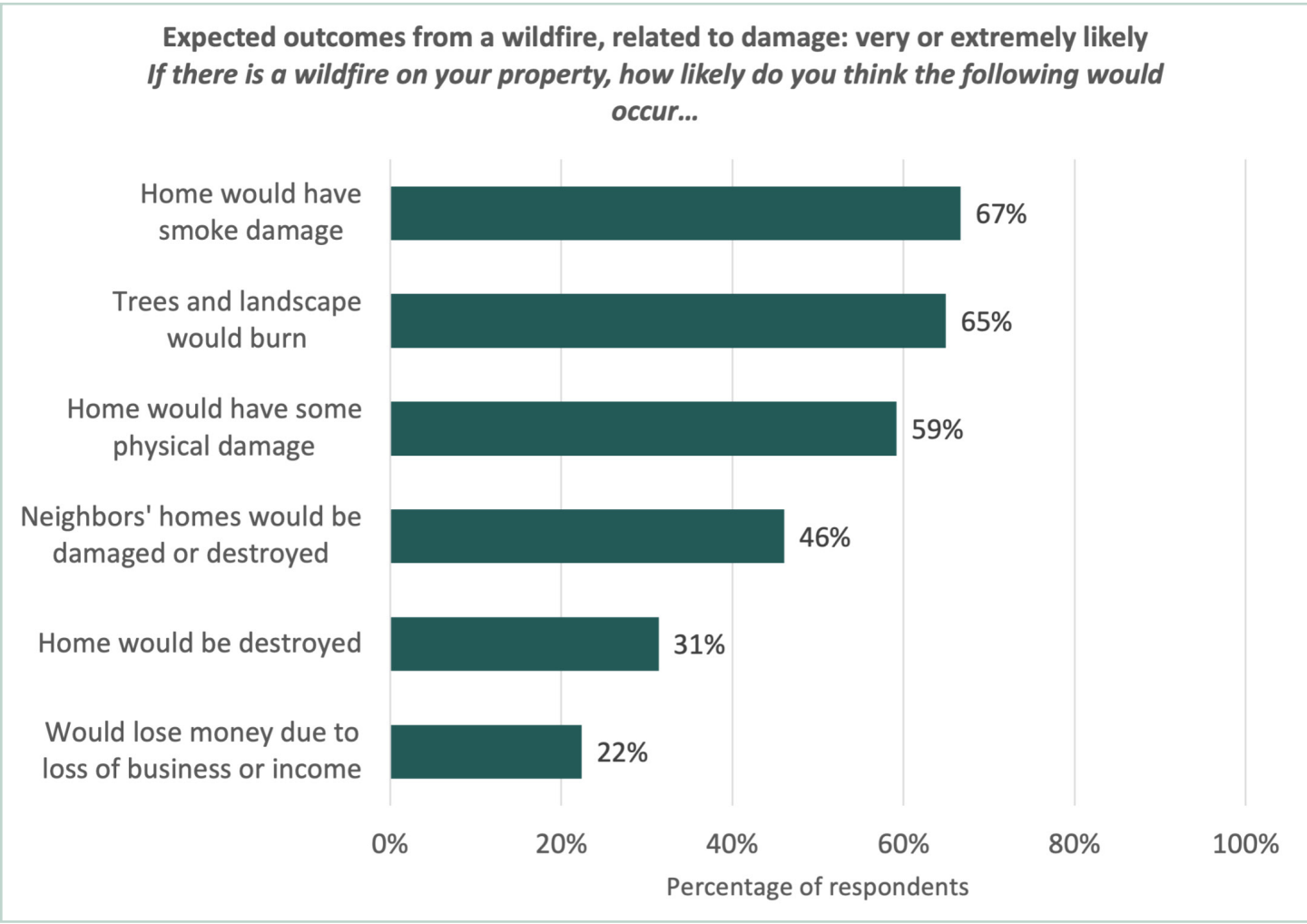

Figure 24—Percentage of respondents who thought the above wildfire outcomes were very or extremely likely in the event of a wildfire on their property, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 152-157 respondents to each survey statement listed.

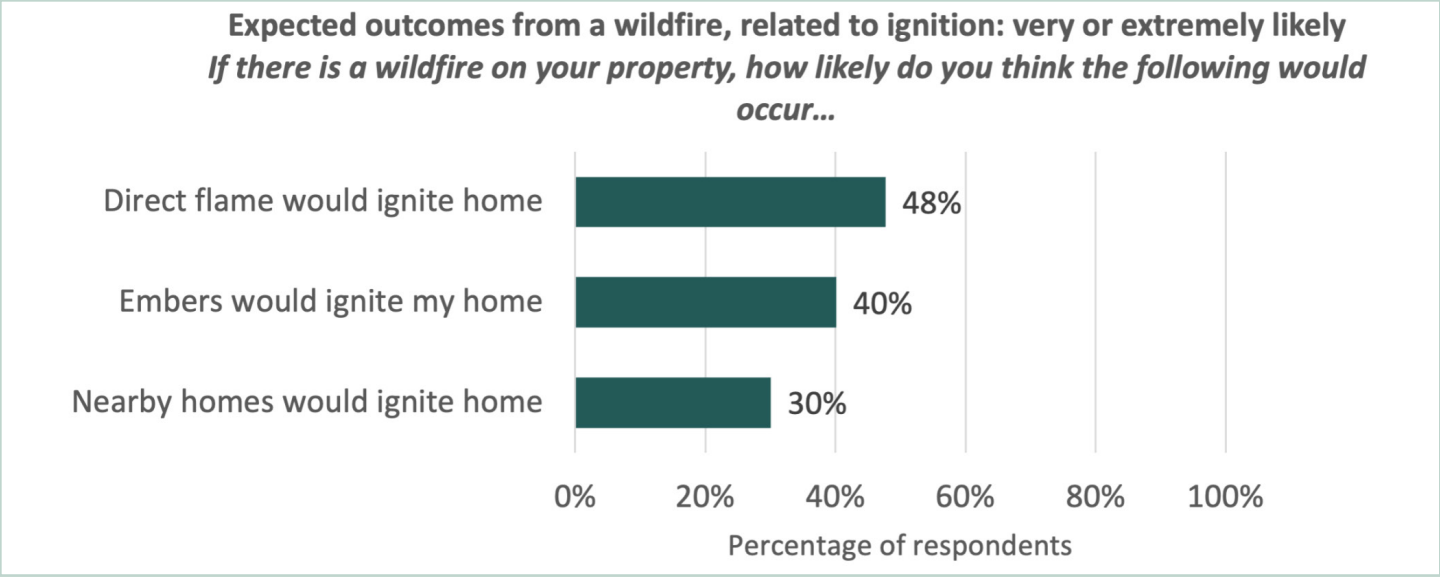

Figure 25—Percentage of respondents who thought the above sources of ignition were very or extremely likely in the event of a wildfire on their property, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 152-153 respondents to each survey statement listed.

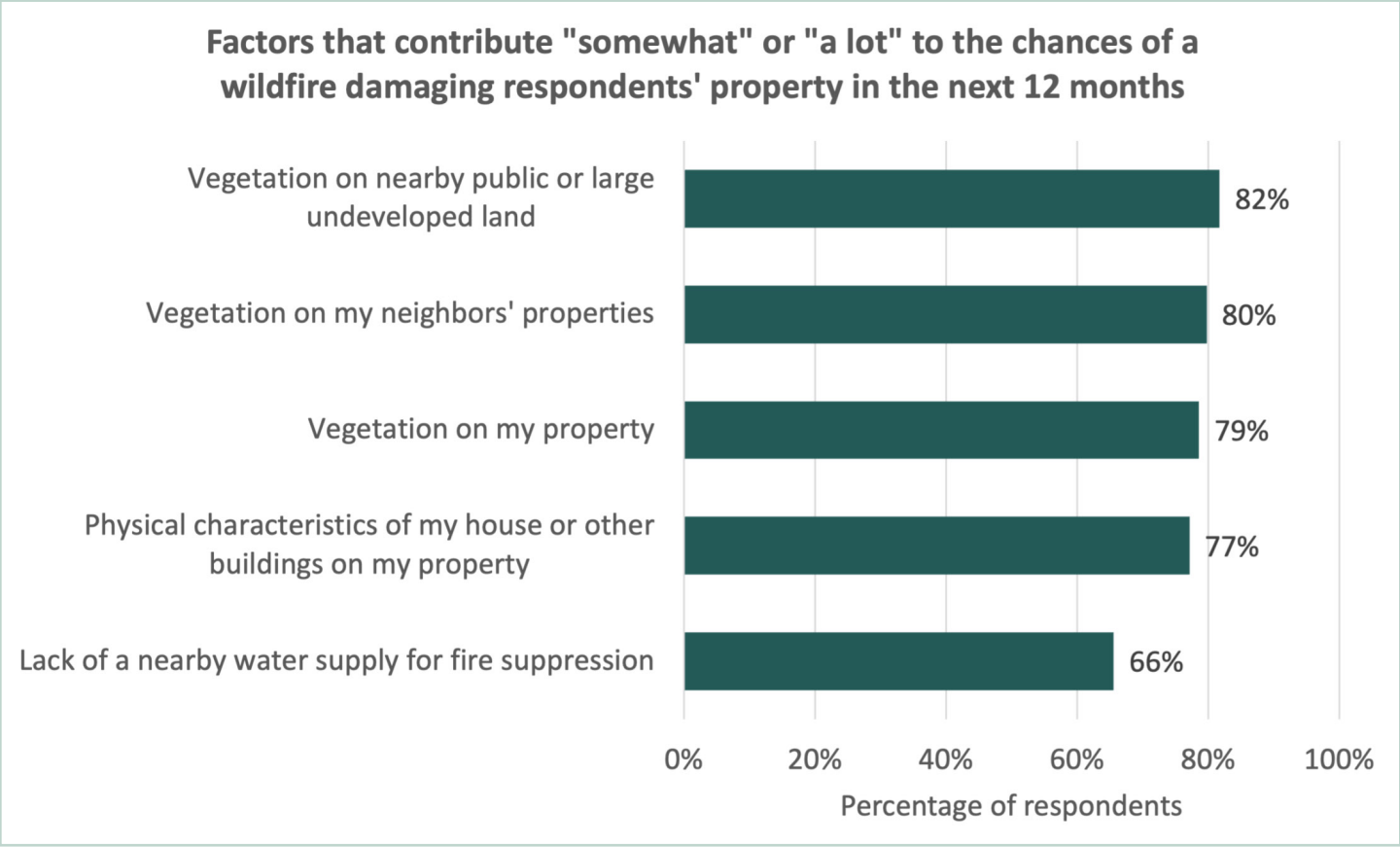

Figure 26—Percentage of respondents who thought the above factors contribute “somewhat” or “a lot” to the chances of a wildfire damaging their property in the next 12 months, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 151-154 respondents to each survey statement listed.

Communication About Wildfire Risk

This section summarizes survey responses related to different forms of communication about wildfire risk, including via private channels such as conversations with neighbors or interactions with insurance companies. It also describes currently used and preferred sources of wildfire risk information and preferred channels (e.g., e-newsletter, radio, in person) for receiving wildfire risk information.

Communication with neighbors and insurance—

More than half (53%) of survey respondents reported talking to their neighbors about wildfire (refer to fig. 27). These interactions can help spread information about localized wildfire risk. Additionally, 57 percent of respondents indicated that some of their neighbors had taken steps to mitigate wildfire risk. Meanwhile, 16 percent reported that most of their neighbors had taken action, 25 percent indicated that none of their neighbors had taken action, and 2 percent reported that all their neighbors had taken action (refer to fig. 28).

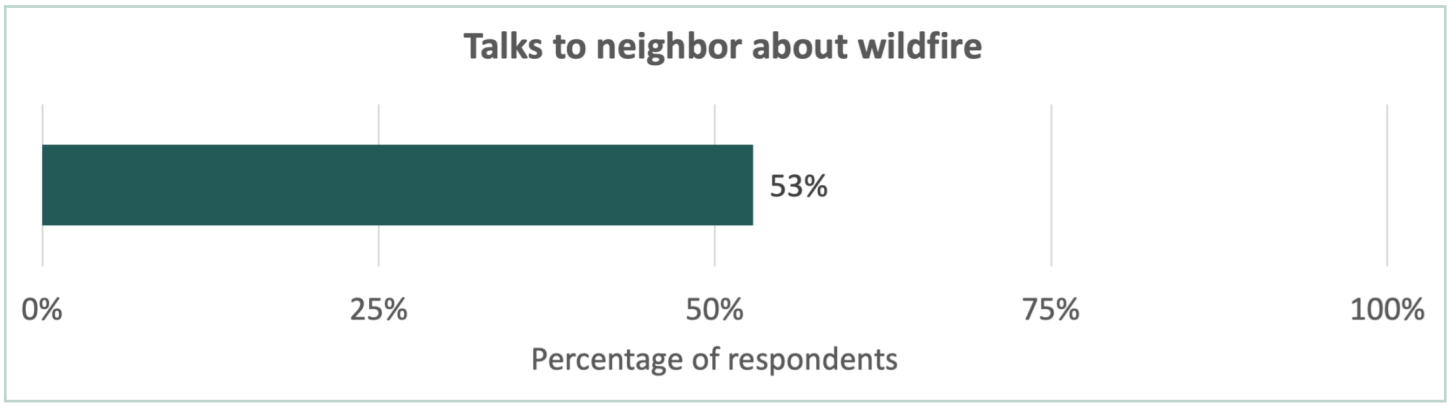

Figure 27—Percentage of respondents who reported talking to their neighbors about wildfire, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 159 respondents to this survey question.

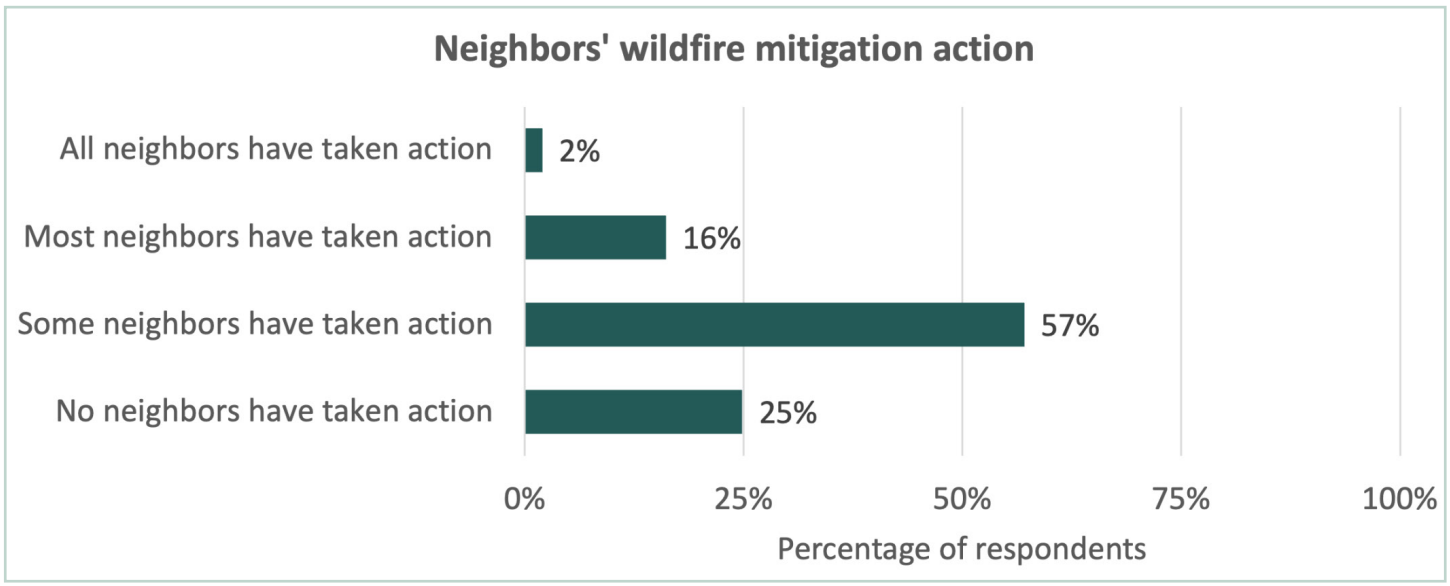

Figure 28—Respondents' estimates of how many neighbors take wildfire mitigation action, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 149 respondents to this survey question.

While insurance providers have the potential to influence homeowners' knowledge and perceptions of wildfire risk and motivate mitigation activities, few survey respondents reported interactions with their insurance company. Nearly one-third (31%) of respondents received information about wildfire risk reduction from their insurance provider. However, fewer reported that their insurance company charged higher premiums due to wildfire risk (24%), provided discounts on their insurance for reducing wildfire risk (11%), refused to provide or renew their insurance due to wildfire risk (11%), or offered private firefighting services (4%). Notably, almost all respondents (97%) reported having homeowner's insurance and 59 percent believed their home was adequately insured against loss from a wildfire (refer to fig. 29).

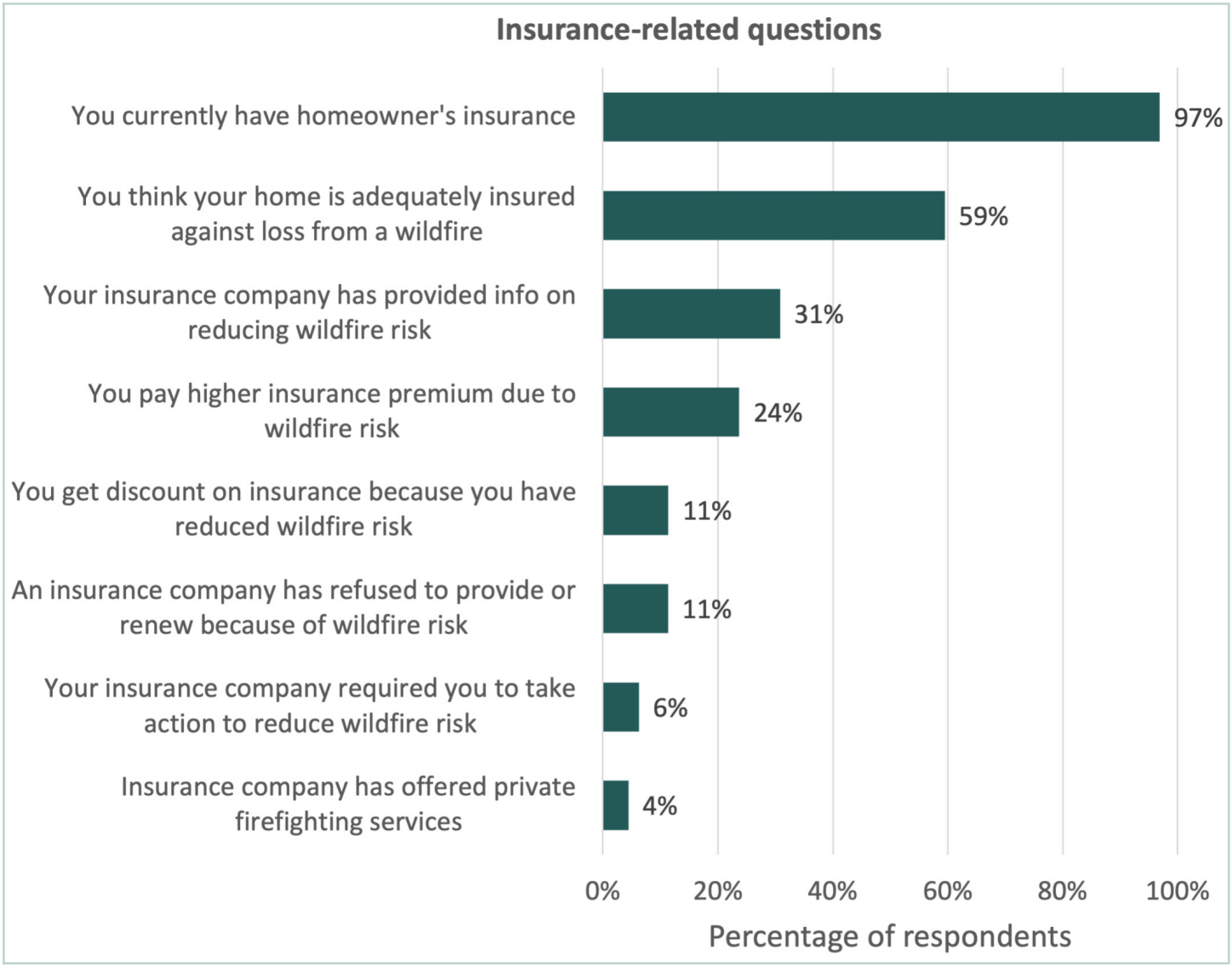

Figure 29—Respondents' knowledge of and experience with various insurance company actions, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 156 to 159 respondents to each statement.

Sources of Information and Reported Usefulness—

Survey respondents were asked whether they had received wildfire risk information from various sources and, if so, to evaluate the usefulness of each source. While the most frequently reported source of wildfire risk information was the media (41%), few respondents (13%) who received information from this source found it extremely or very useful. While many sources of wildfire risk information were available, most reached less than a quarter of respondents.

Aside from the media, respondents received wildfire risk information from the following sources: the CSFS (e.g., Live Wildfire Ready Program) (34%), LLCFR (32%), the USDA Forest Service (San Isabel National Forest) (22%), community groups or homeowners' associations (HOA; 21%), local government (21%), and local arborists (21%). Among these top sources, respondents reported that the following were very or extremely useful: the CSFS (52%), the USDA Forest Service (45%), LLCFR (43%), local arborists/contractors (41%), community groups or HOAs (36%), and local government (31%) (refer to fig. 30).

Current and preferred channels of communication—

There are many different channels through which information about wildfire may be distributed. The survey asked participants how they currently receive wildfire-related information and how they would prefer to receive it. Overall, no single information channel was currently received or preferred by more than 50 percent of respondents. The top channels through which survey respondents received information were TV news (26%), newspapers (23%), internet (non-social media) (21%), and mailed newsletters (21%). The most preferred communication channels were email/e-newsletters (50%), mailed newsletters (48%), conversations with local wildfire specialists (41%), and community meetings (28%) (refer to fig. 31).

Mitigation and preparedness activities—

Evacuation planning—

Evacuation planning is a critical step in wildfire preparedness, and most survey respondents appear to have completed some planning. Most survey respondents (59%) reported having evacuation plans for the people in their households (refer to fig. 32a). Among survey respondents with pets, 58 percent had an evacuation plan for their animals (refer to fig. 32b) and 22 percent of survey respondents with livestock had a plan for their animals (refer to fig. 32c).

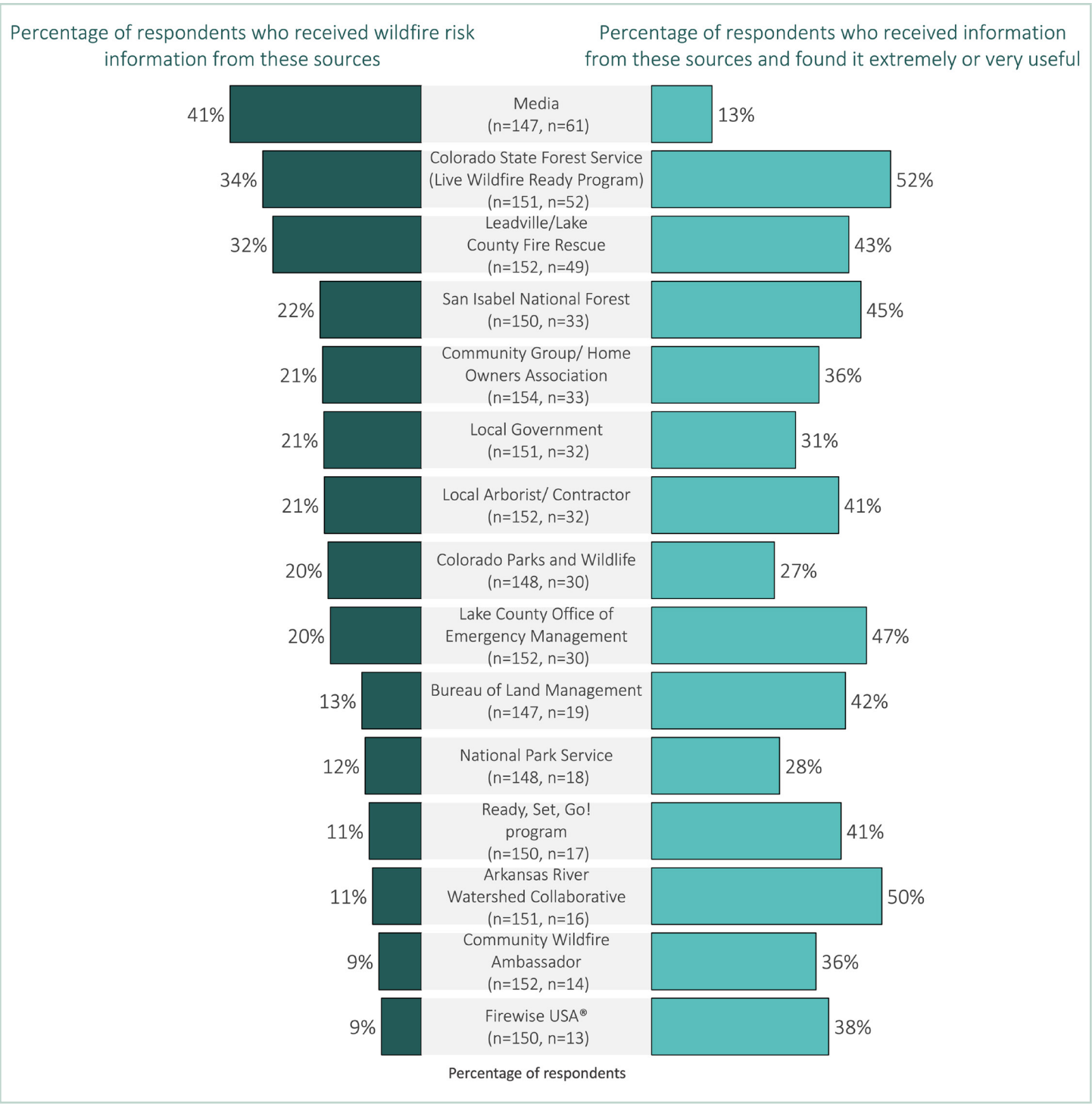

Figure 30—Percentage of respondents who received wildfire risk information, by source, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. These data are compared to the percentage of people who said they found each source's wildfire risk information extremely or very useful (percentage of all respondents who received wildfire risk information from that source). N = 148-154 respondents to source receipt questions; N = 13-52 respondents to source usefulness questions.

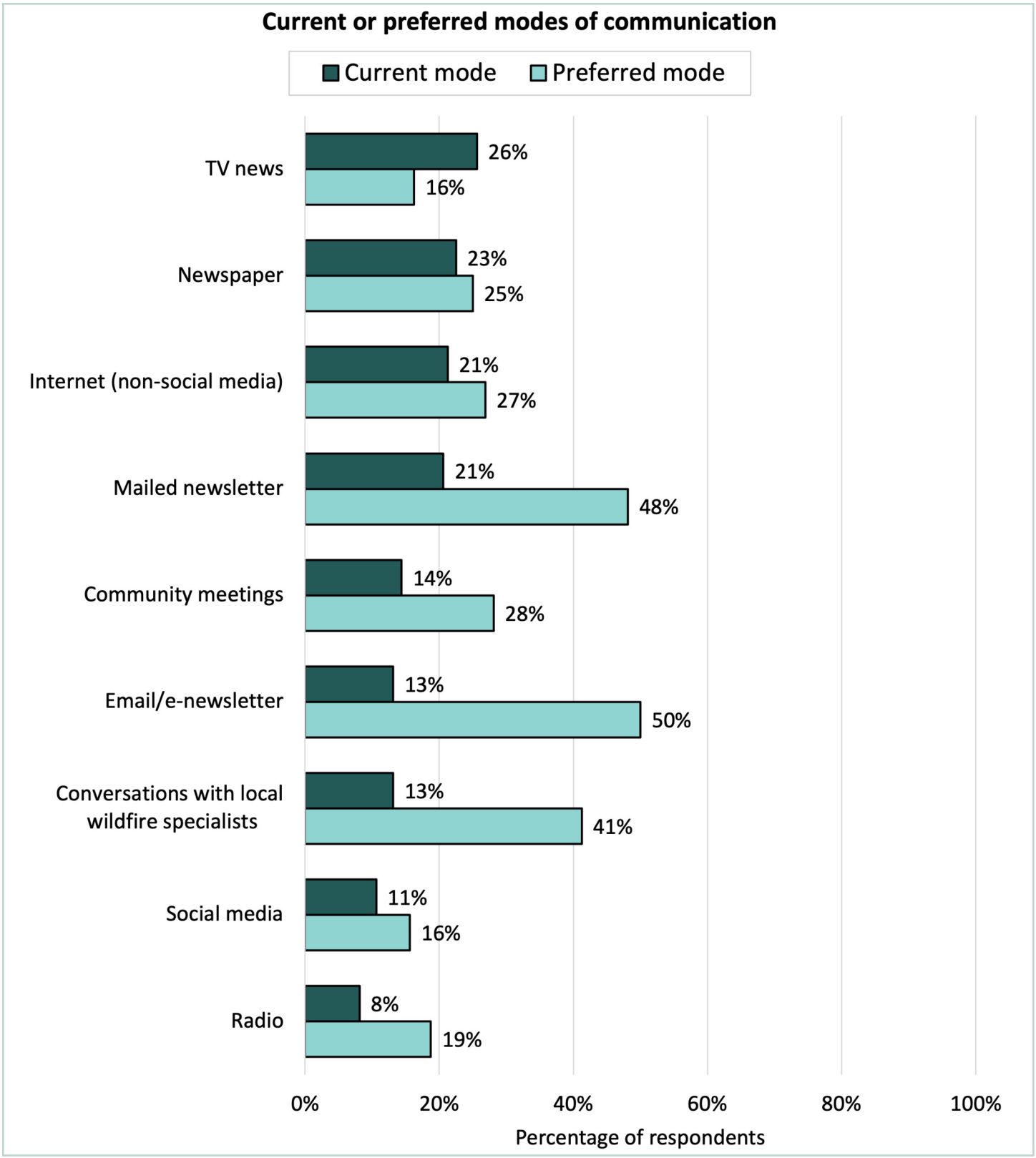

Figure 31—Comparison of current and preferred channels of communication about wildfire risk, ordered by current channels of communication, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. Survey respondents were able to select multiple options. N = 160 responses to current channels; N = 160 responses to preferred channels.

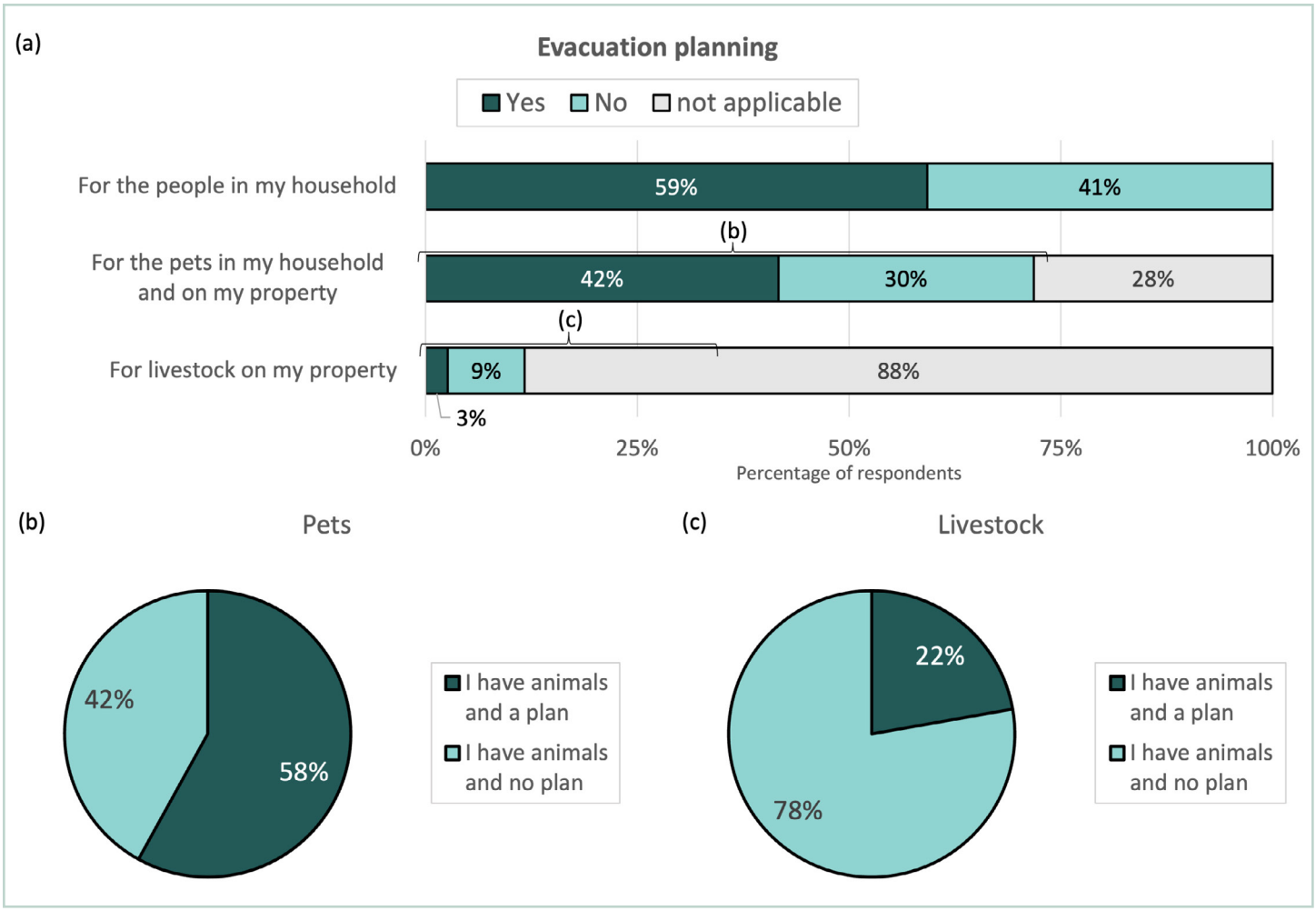

Figure 32—(a) Percentage of survey respondents who report having wildfire evacuation plans for people in the household and for pets and livestock, out of all responses to this question (n=154–157). (b) Of respondents with pets, percentage who have a wildfire evacuation plan for their pets (n=112). (c) Of respondents with livestock, percentage of have a wildfire evacuation plan for their livestock (n=18). Data as reported in 2023 by survey respondents residing in the Lake County, Colorado, study area.

Respondents were asked to report on the evacuation actions they had completed and to identify evacuation topics for which they wanted more information. Although 59 percent of survey respondents reported having evacuation plans for the people in their household (refer to fig. 32a), the survey responses about specific evacuation actions indicate that these plans could be further refined. Overall, no completed action was reported by more than 50 percent of respondents, and no request for additional information on an action exceeded 61 percent. Notably, fewer respondents have discussed evacuation with their neighbors (18%), created a checklist (22%), signed up for emergency notifications (22%), or identified how they would be notified (25%). These four evacuation actions also had the highest percentages of respondents requesting more information—43%, 47%, 61%, and 57%, respectively. Half of respondents (50%) reported having identified safe evacuation routes, and an equal percentage had determined what to take and what to leave behind. Less than half (48%) have identified where to evacuate, and 45 percent identified where to stay long-term. Thirty-one percent of respondents have packed a go bag with important items needed for an evacuation, and just 39 percent requested more information on this action (refer to fig. 33).

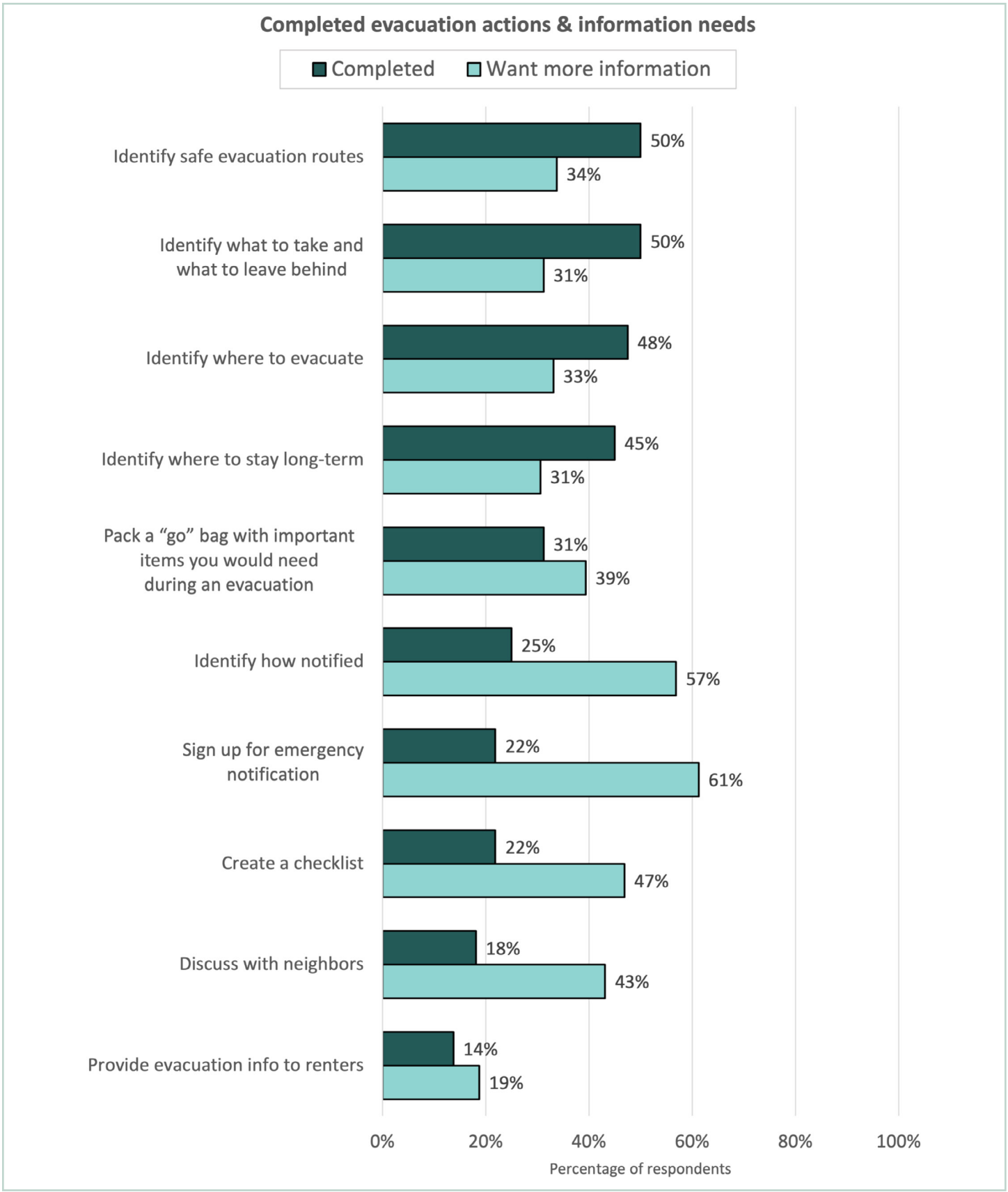

Figure 33—Evacuation preparations completed and information that would be helpful in evacuation plan development, ordered by actions completed, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 160 respondents to both completed action and wanting more information segments.

Wildfire risk mitigation —

There are several ways property owners can reduce the risk of wildfire damage to or destruction of their homes. The three most reported activities by respondents were reducing vegetation (82%), regularly clearing roofs and gutters (78%), and regularly mowing or raking around their residence (74%). Less common mitigation activities on their property included hardening their home (47%), and meeting with a wildfire professional to evaluate their home's risk (28%). Respondents reported fewer mitigation actions beyond their own properties, such as interacting with public land managers about fuels reduction (17%), helping neighbors reduce vegetation on their properties (17%), participating in a community wildfire activity (14%), and helping reduce vegetation on community property (13%) or on nearby public lands (10%). Participating in a cost-share program (5%) and applying for a burn permit in 2023 (1%) were reported as the least common activities (refer to fig. 34).

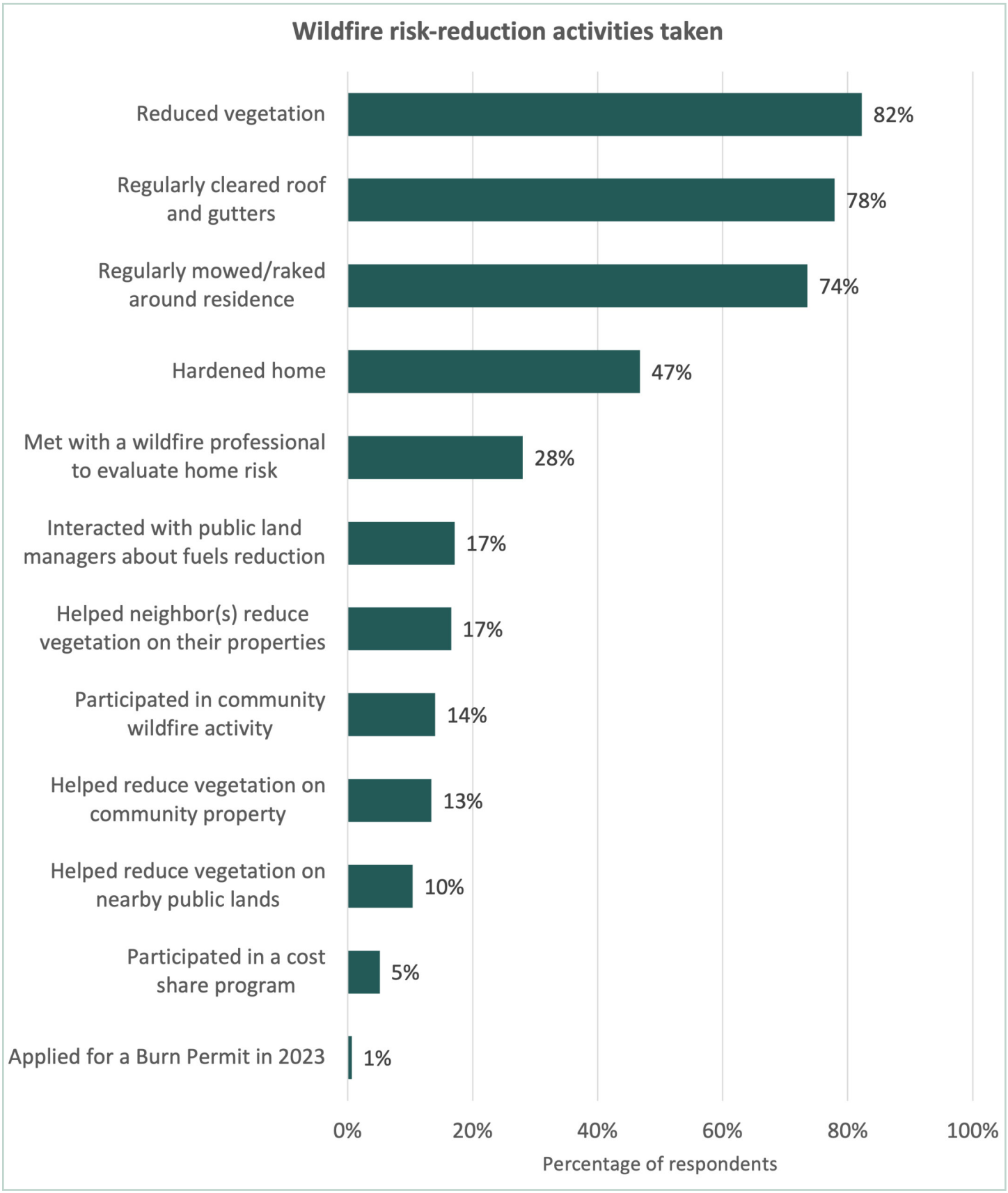

Figure 34—Percent of respondents who reported doing the above wildfire risk mitigation activities, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 154-158 respondents for each of the above activity statements.

Barriers to conducting mitigation—

Respondents were asked about four categories of potential barriers that limit their ability to reduce wildfire risk on their property:

- Personal resources
- Lack of specific information
- Personal perspectives
- Community-related barriers

Across all four categories, the top three reported barriers were from the personal resources category: financial expense or cost (46%), time to do work (32%), and physical ability to do work (32%). Within this category, nearly a third (30%) of respondents indicated that none of these factors were barriers to wildfire mitigation (refer to fig. 35).

In the lack of specific information category, more than half of respondents (54%) reported that none of the factors were barriers. The most reported barrier in this category was the lack of information on how to reduce risk on their property (30%), followed by lack of information on where to dispose of vegetation or slash (22%), and lack of information on factors contributing to their property's wildfire risk (19%) (refer to fig. 36).

In the personal perspectives category, more than half (62%) of respondents indicated that none of the three factors were barriers to conducting mitigation. Among those who did report barriers in this category, the most common was the belief that taking action would not reduce their property's wildfire risk (16%), followed by reluctance to change the appearance of their property (12%) and a low priority given to mitigation (12%) (refer to fig. 37).

Lastly, in the community-related barriers category, more than three quarters (78%) of respondents reported that none of the three factors were barriers to conducting mitigation. Among those who reported barriers, 14 percent cited a lack of options for disposing of vegetation or slash, 8 percent reported restrictions on changes that could be made to property, and 4 percent indicated that social pressure from neighbors prevented them from taking action to reduce wildfire risk (refer to fig. 38).

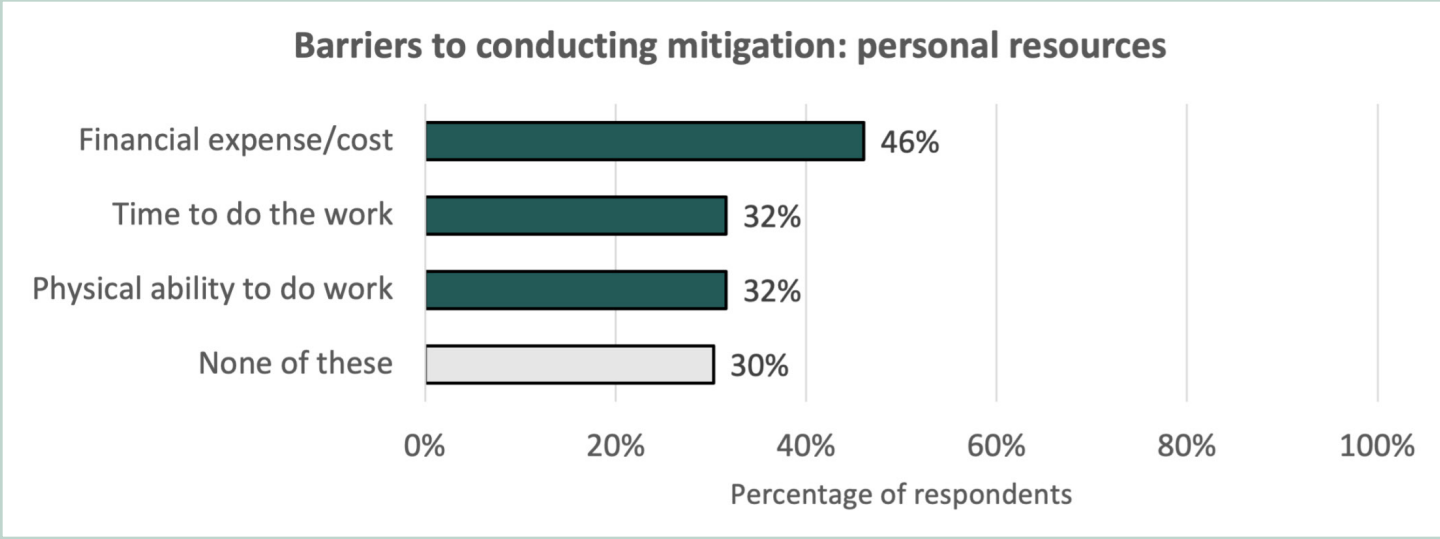

Figure 35—Personal barriers to conducting wildfire mitigation activities on property, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 152 respondents for each of the above barriers.

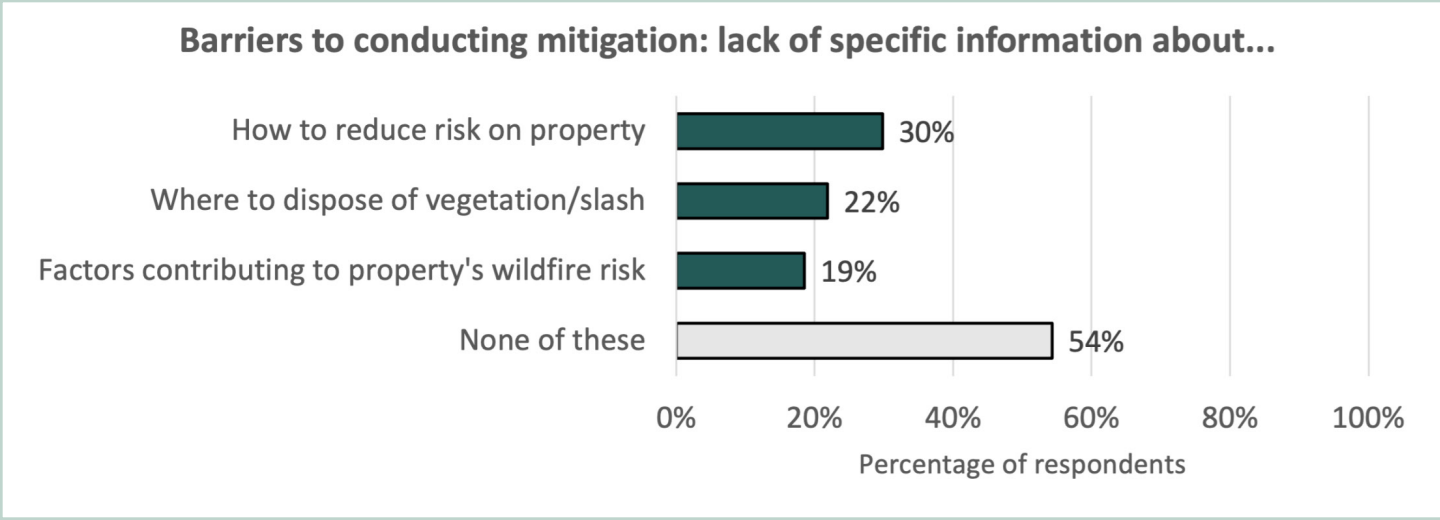

Figure 36—Information barriers to conducting wildfire mitigation activities on property, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 151 respondents for each of the above barriers.

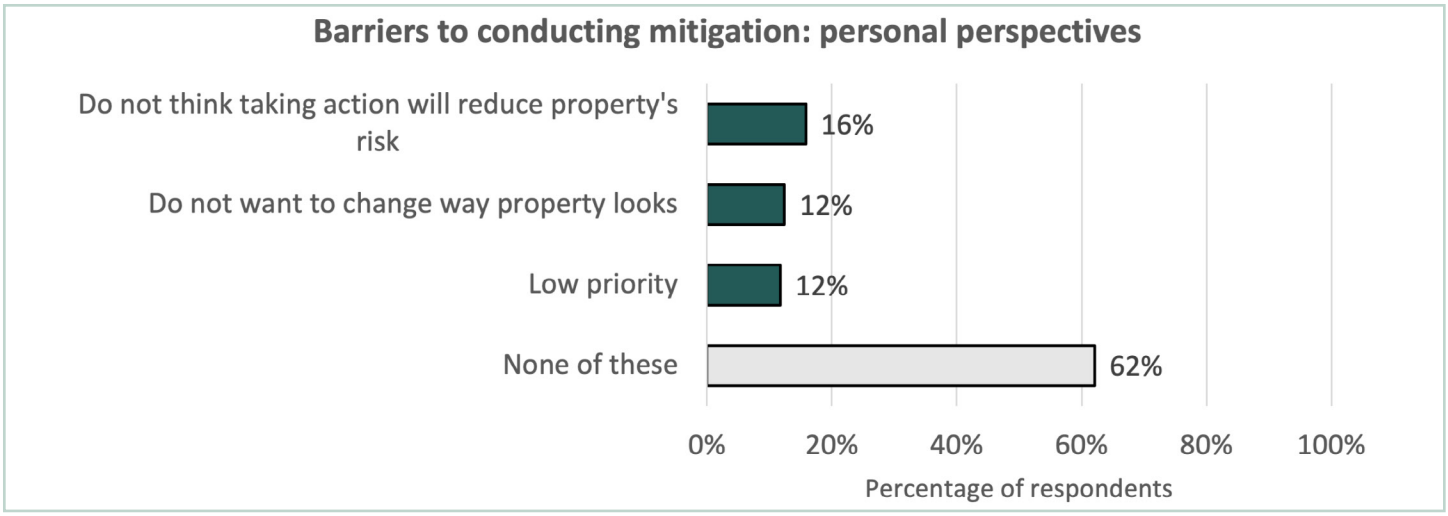

Figure 37—Personal perspectives or values that might affect wildfire mitigation activities on property, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 145 respondents for each of the above barriers.

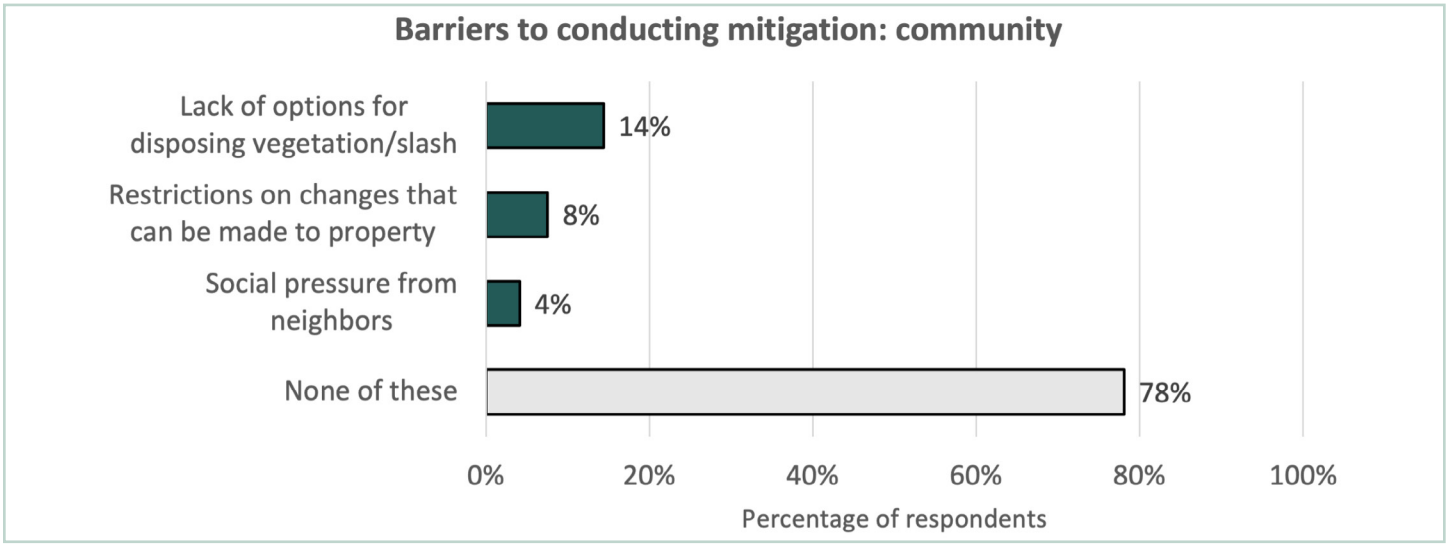

Figure 38—Community-related barriers to conducting wildfire mitigation activities on property, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 146 respondents for each of the above barriers.

Incentives to conducting mitigation—

Survey respondents were also asked about three categories of potential incentives that might encourage them to conduct wildfire mitigation activities on their properties:

- Resources
- Information
- Social incentives

Across all three categories, the top three reported incentives included two from the resources category: cost-share or financial assistance (56%) and help doing the work (47%). The least popular incentive in this category was recommended contractors (27%), while 21 percent

reported that none of the three incentives would encourage them to undertake wildfire mitigation activities (refer to fig. 39).

The second most popular incentive overall came from the information category, with 53 percent of respondents reporting that a report describing their property's wildfire risk factors would encourage them to take action. Additionally, 44 percent reported that a one-on-one visit with a wildfire risk expert would motivate them to reduce wildfire risk, while 22 percent found videos demonstrating wildfire risk reduction to be an incentive. Lastly, 28 percent of survey respondents indicated that none of these incentives would encourage them to take action to reduce wildfire risk on their property (refer to fig. 40).

Social incentives were reported the least among survey respondents, with 47 percent of respondents indicating that none of the three incentives in this category would motivate them to take action to reduce wildfire risk on their property. However, the most commonly reported incentive in this category was receiving feedback on work done to reduce their property's risk (35%), followed by a neighborhood group organizing wildfire risk-reduction activities (27%) and recognition for taking action (11%) (refer to fig. 41).

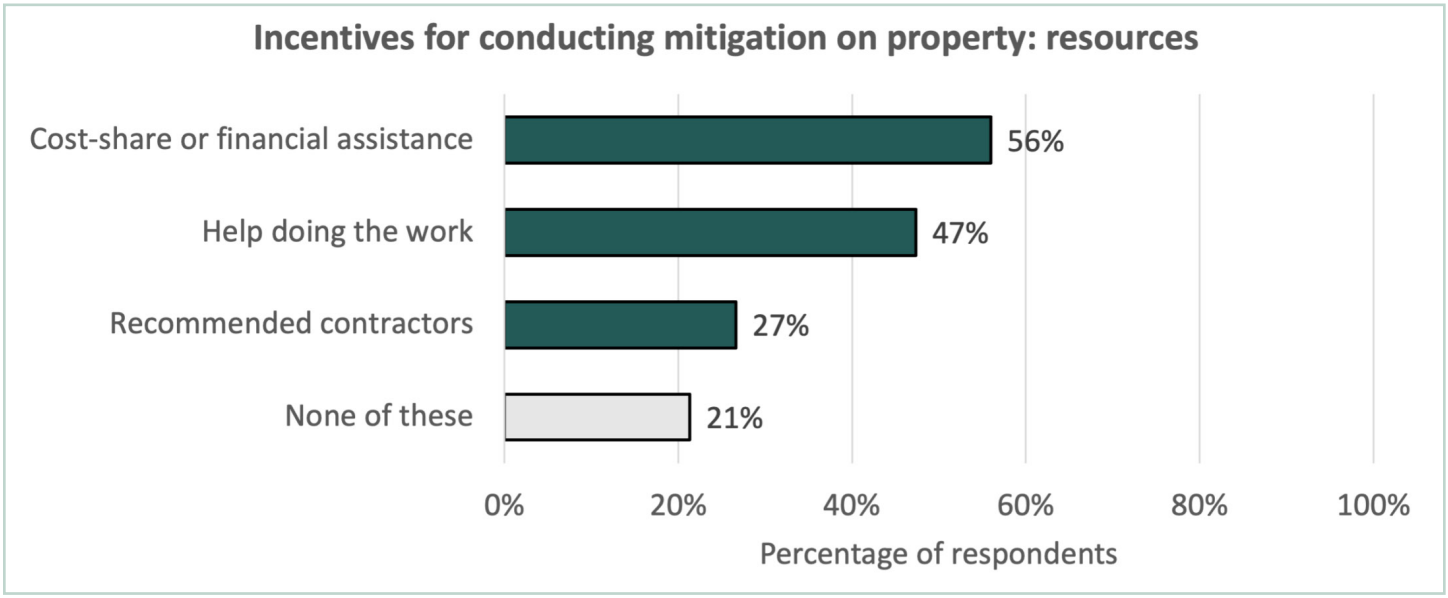

Figure 39—Resource-related incentives for conducting wildfire mitigation activities on property, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 150 respondents for each of the above incentives.

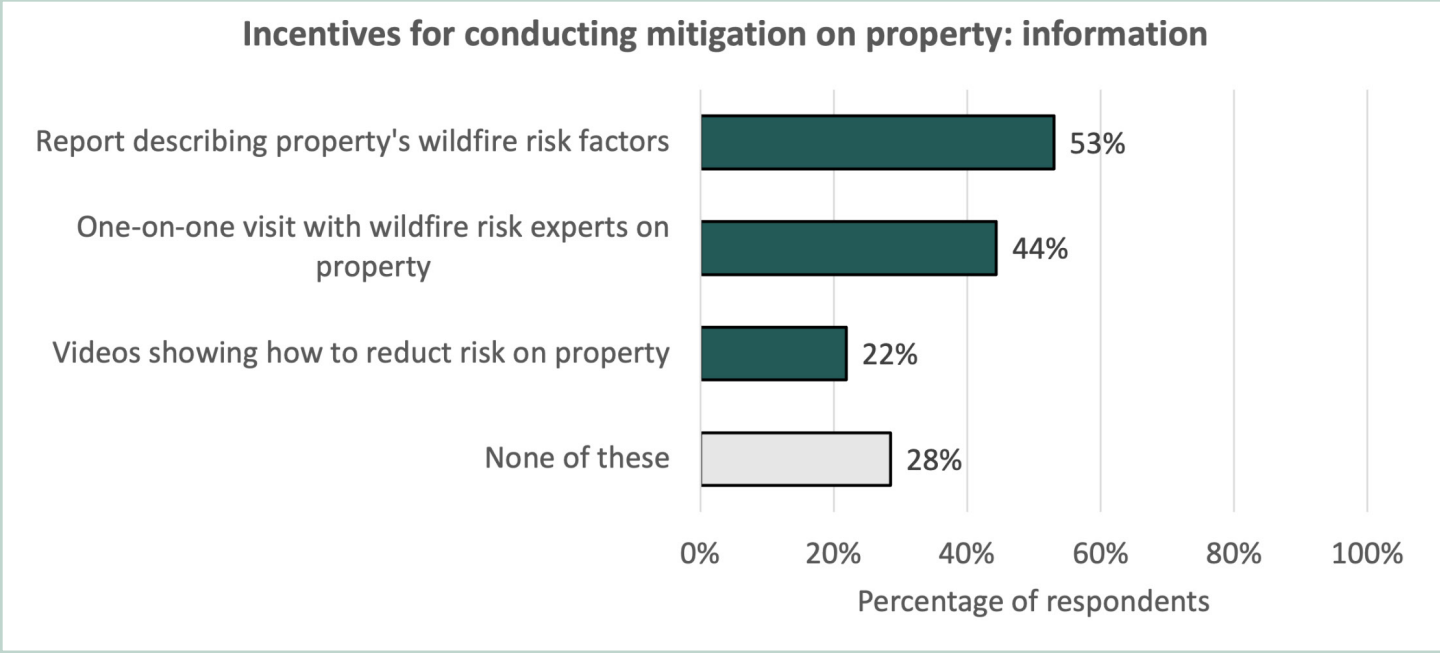

Figure 40—Information-related incentives for conducting wildfire mitigation activities on property, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 151 respondents for each of the above incentives.

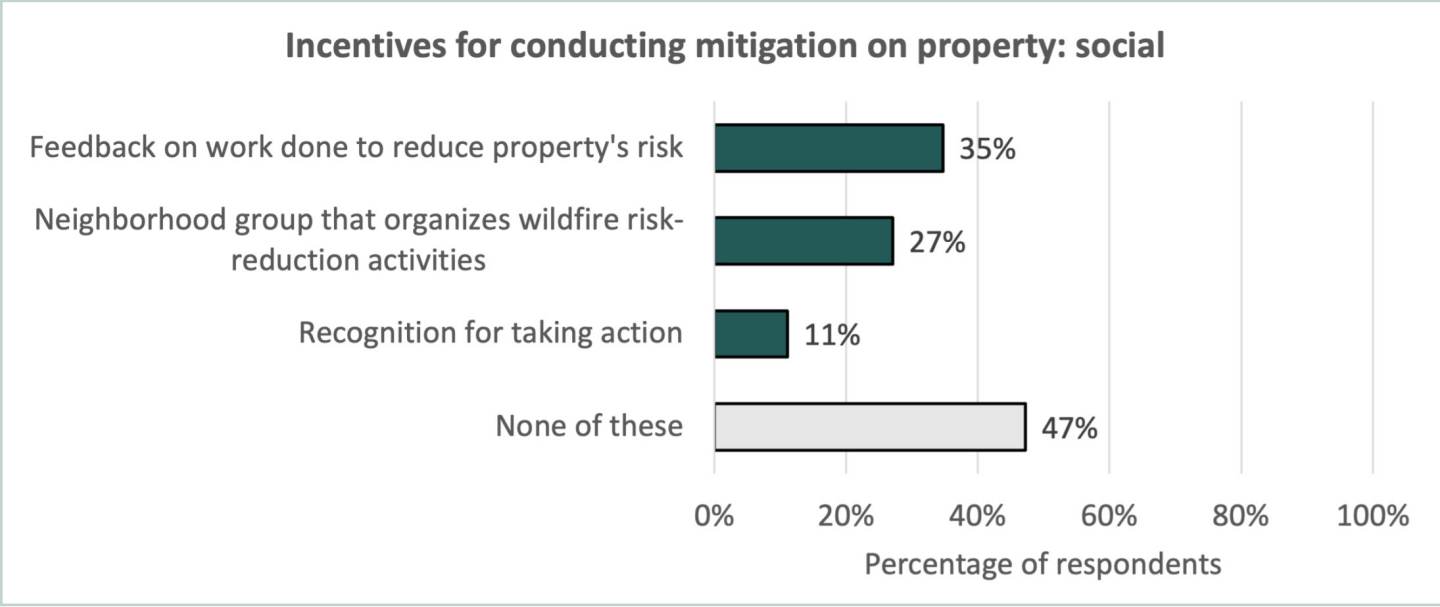

Figure 41—Other incentives for conducting wildfire mitigation activities on property, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 144 respondents for each of the above incentives.

Perceptions of Community Risk Reduction Strategies and Fire Management

Support for risk management practices—

Overall, most survey respondents found fuels treatments on nearby public lands to be extremely or very acceptable. Among the nine treatments included in the survey, the most widely accepted was removing trees and reducing other vegetation (69%), followed by

removing vegetation along roadways (64%), burning piles of vegetation (64%), creating a fuel break on nearby public lands (63%), removing trees and reducing other vegetation on HOA property (55%), and conducting a prescribed fire ignited by fire professionals (52%). Fewer than half of respondents considered the following treatments extremely or very acceptable: allowing a naturally ignited fire to burn (43%), creating a patch cut on nearby public lands (41%), and burning piles of vegetation on private lands (37%) (refer to fig. 42).

Among the five proposed wildfire regulations and practices, each was found to be extremely or very acceptable by at least 50 percent of respondents. The most widely supported wildfire regulation was the adoption of building codes requiring fire-resistant materials for structures located in fire-prone areas (73%), followed by the adoption of growth policies or land-use regulations that limit new development in fire-prone areas (65%) and adoption of development standards requiring vegetation management on lots in fire-prone areas (64%). While still broadly supported, temporarily shutting off the power grid during extreme fire risk days to prevent new wildfire ignitions (50%) received the lowest level of support (refer to fig. 43).

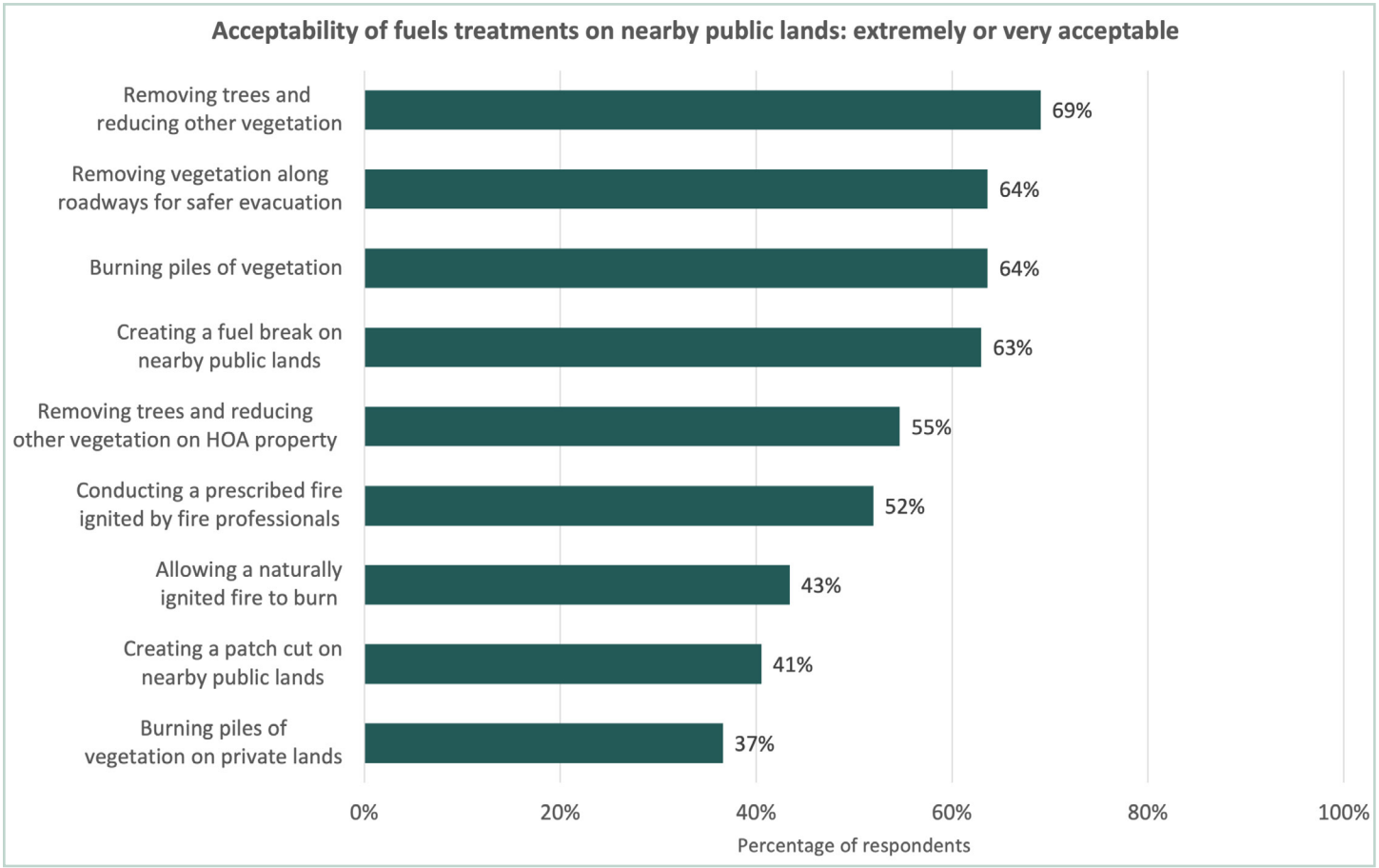

Figure 42—Percentage of respondents who found each of the above wildfire fuels management approaches extremely or very acceptable, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 150-155 respondents for each of the above statements. HOA = Homeowners Association.

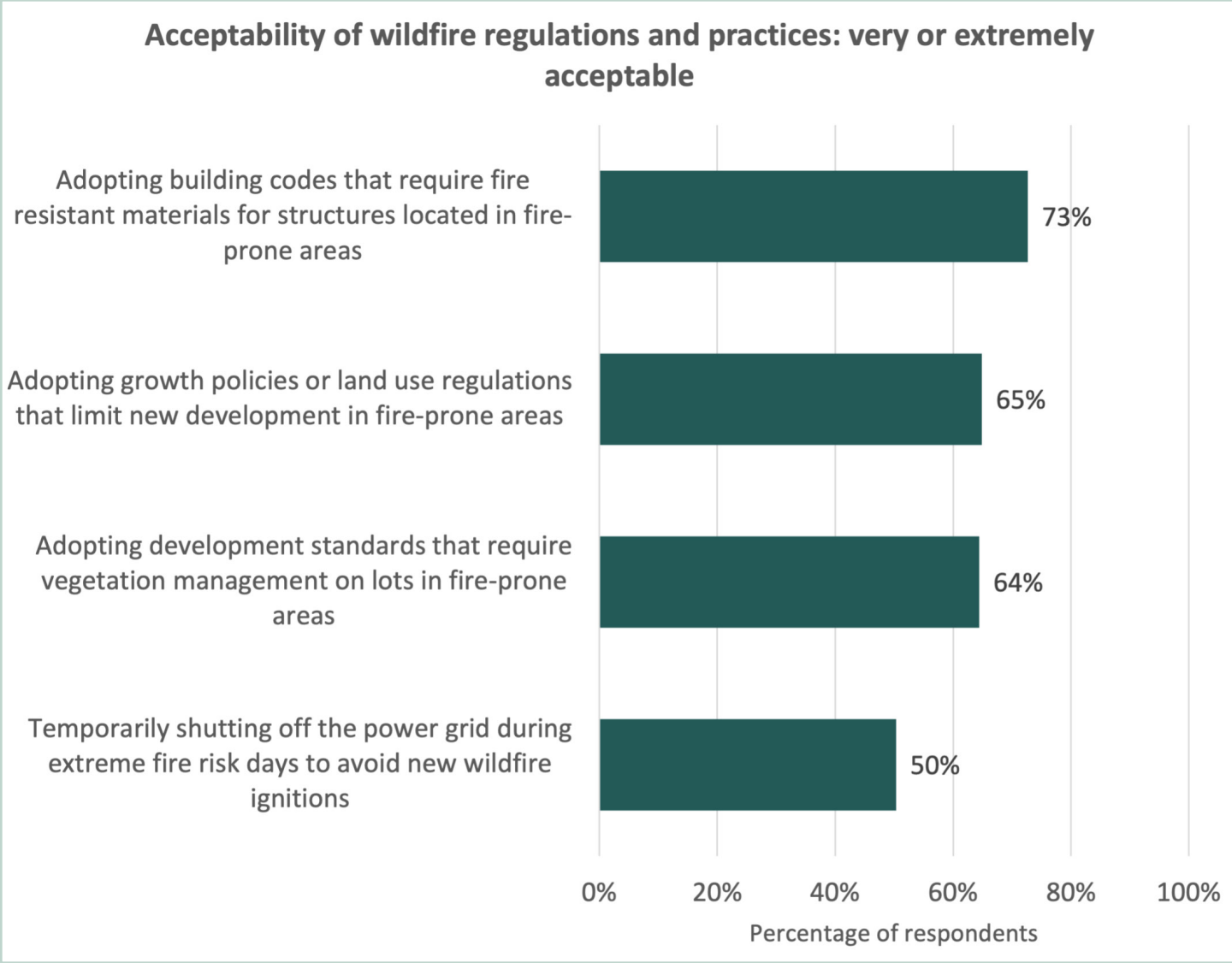

Figure 43—Percentage of respondents who found each of the above wildfire-related policies extremely or very acceptable, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 148-154 respondents for each of the above statements.

Notions of hazard and response—

We asked respondents to what extent they agreed or disagreed with a wide range of statements about wildfire. Most survey respondents agreed or strongly agreed that wildfires threatening human life (94%) and homes (85%) should be suppressed. Additionally, most respondents (90%) agreed or strongly agreed that wildfires are a natural part of a healthy forest ecosystem. Sixty-seven percent of survey respondents agreed or strongly agreed that saving homes should be a priority over saving forests during wildfire events (refer to fig. 44).

Despite their preference for wildfire suppression, respondents were less confident in the available technology and resources available to do so. One-third (33%) of respondents agreed or strongly agreed that most wildfires can be controlled with proper technology. Similarly, 13 percent agreed or strongly agreed that local firefighters have sufficient resources to protect threatened homes from wildfires, and just 6 percent agreed or strongly agreed that firefighters have sufficient resources to prevent wildfires from spreading (refer to fig. 45).

Another statement identified in the household survey is about the risk wildfires pose to the local water supply. Nearly one-third (30%) of respondents agreed or strongly agreed that wildfires threaten their community's water supply (refer to fig. 46).

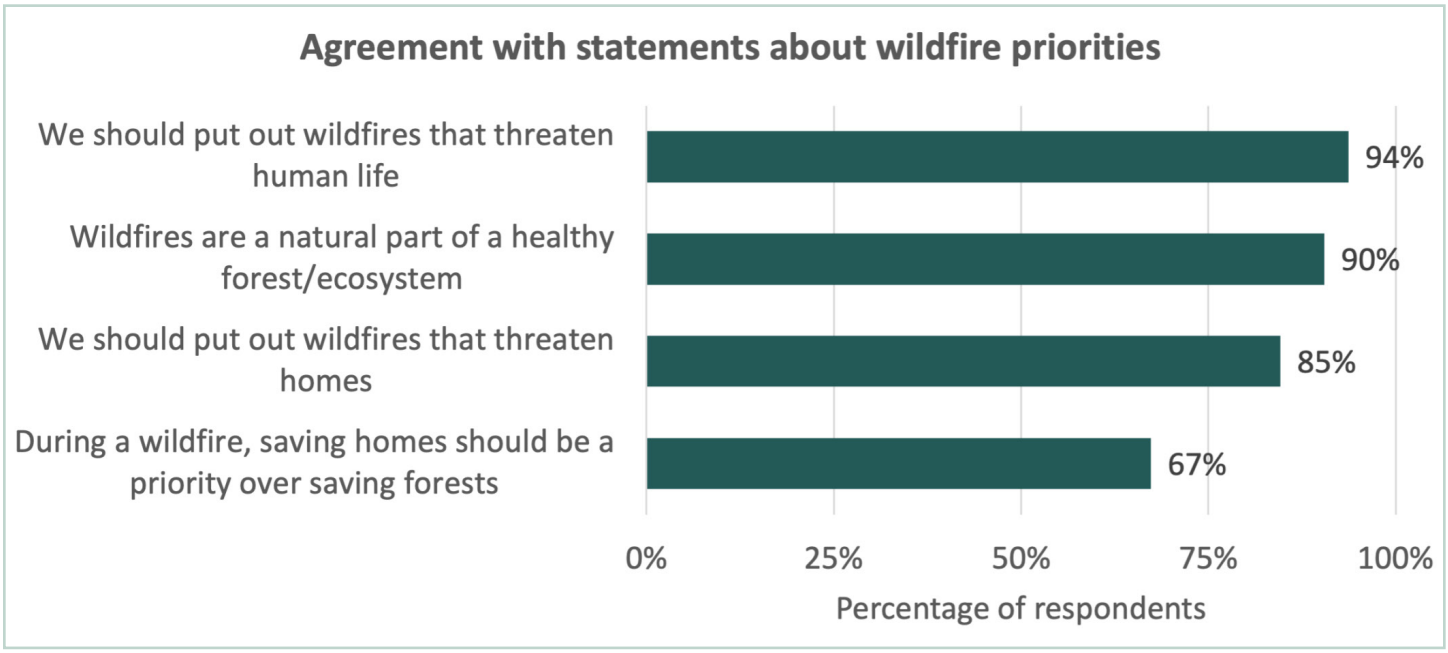

Figure 44—Agreement ("agree" or "strongly agree") with statements about priorities between human and natural resources during a wildfire, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 156-158 respondents to each survey statement listed.

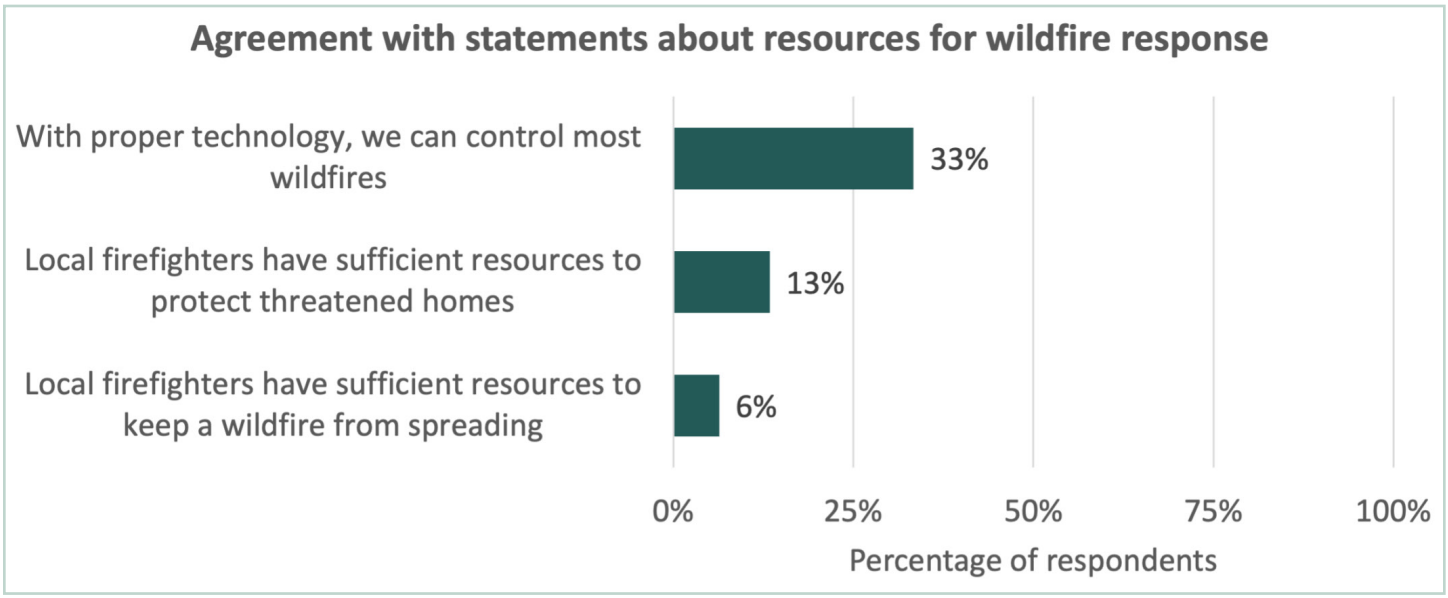

Figure 45—Agreement ("agree" or "strongly agree") with statements about available technology and resources to prevent wildfire impacts, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 156-157 respondents to each survey statement listed.

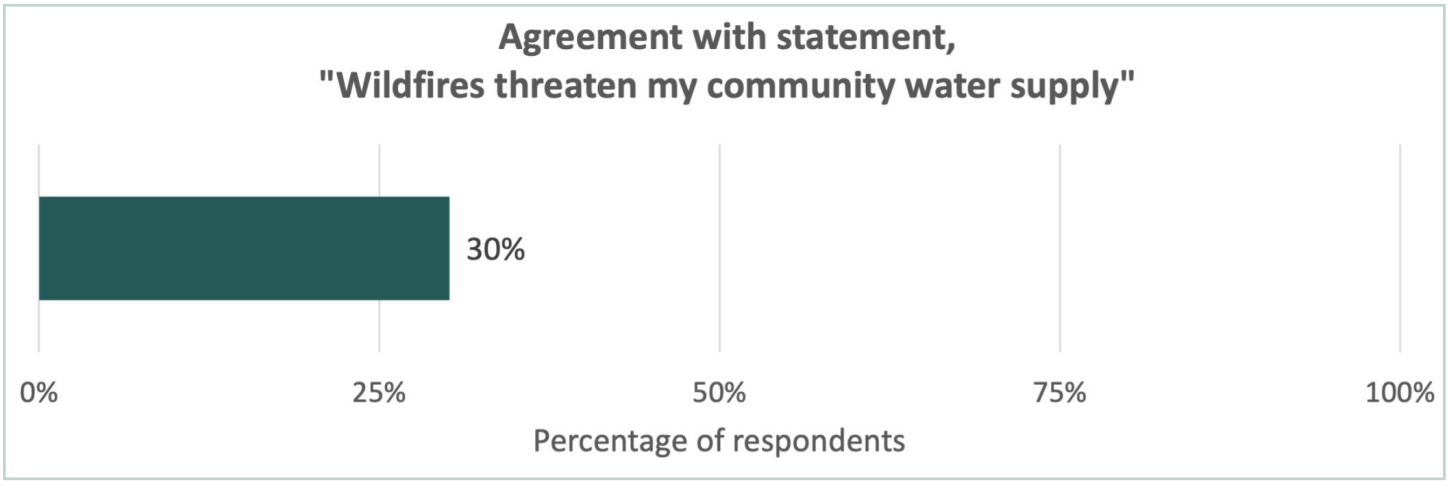

Figure 46—Agreement ("agree" or "strongly agree") with statement about wildfire threat to water supply, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 156 responses to the survey statement listed.

While nearly half (42%) agreed or strongly agreed that new residential development in fire-prone areas increases the wildfire risk to their property, 29 percent agreed or strongly agreed that their efforts to mitigate wildfire risk on their properties were not effective because of vegetation on nearby private or public lands. Furthermore, 7 percent agreed or strongly agreed with the statement that they live in their current location because of the trees and would not remove any to reduce wildfire risk. Very few respondents agreed or strongly agreed that managing the wildfire danger is a government responsibility (4%), firefighters should risk their lives to protect their home (3%), and homeowners' actions to reduce wildfire risk are ineffective (3%). None of the respondents indicated that they plan to move out of the area in the next 12 months because of wildfires (refer to fig. 47).

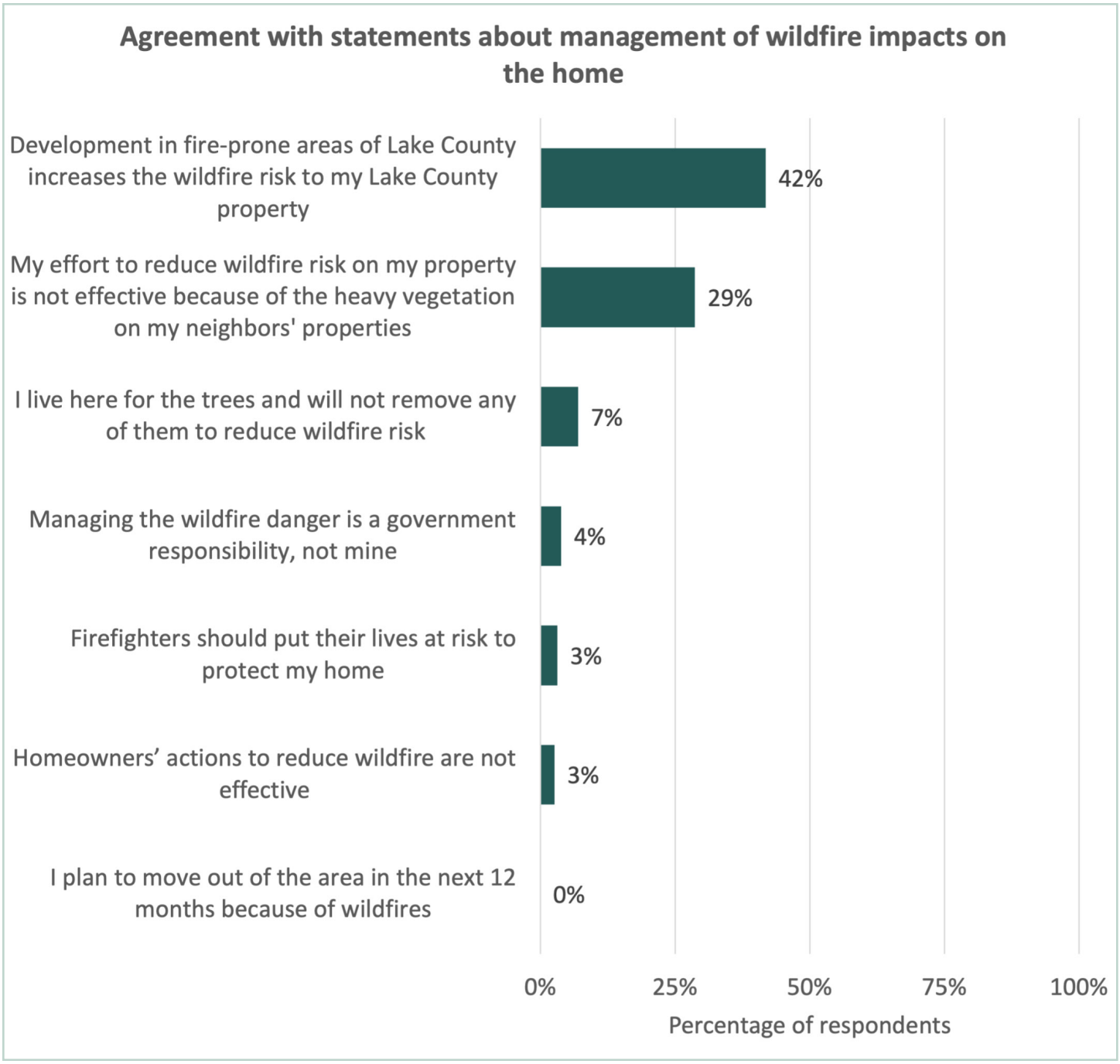

Figure 47—Agreement ("agree" or "strongly agree") with statements about personal and community management of wildfire impacts on the respondent's home, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 155–158 respondents to each survey statement listed.

Lastly, respondents were asked to consider the effect of two management approaches to reducing wildfire risk – burning vegetation and manual or mechanical removal of vegetation – on the following: look of the landscape in the first few years, long-term look of the landscape, forest health, water quality, and recreation opportunities. More than half (58%) of respondents indicated that they thought burning fuels worsened the "look of the landscape" in the first few years, while nearly a third (32%) indicated that mechanical/manual treatments worsened the look of the landscape in this short-term timeline. In contrast, more

than half (55%) indicated that they thought burning fuels improved the "long-term look of the landscape". Likewise, more than half (63%) indicated the same for mechanical/manual fuels reduction. Respondents reported that both approaches to removing vegetation (burning and mechanical/manual) would improve forest health (85% and 86%, respectively). Results were mixed for the effects of these two approaches on water quality and recreation. Respondents reported that burning and mechanical/manual approaches neither worsened nor improved water quality (45% and 59%, respectively) or recreation (49% and 55%, respectively).

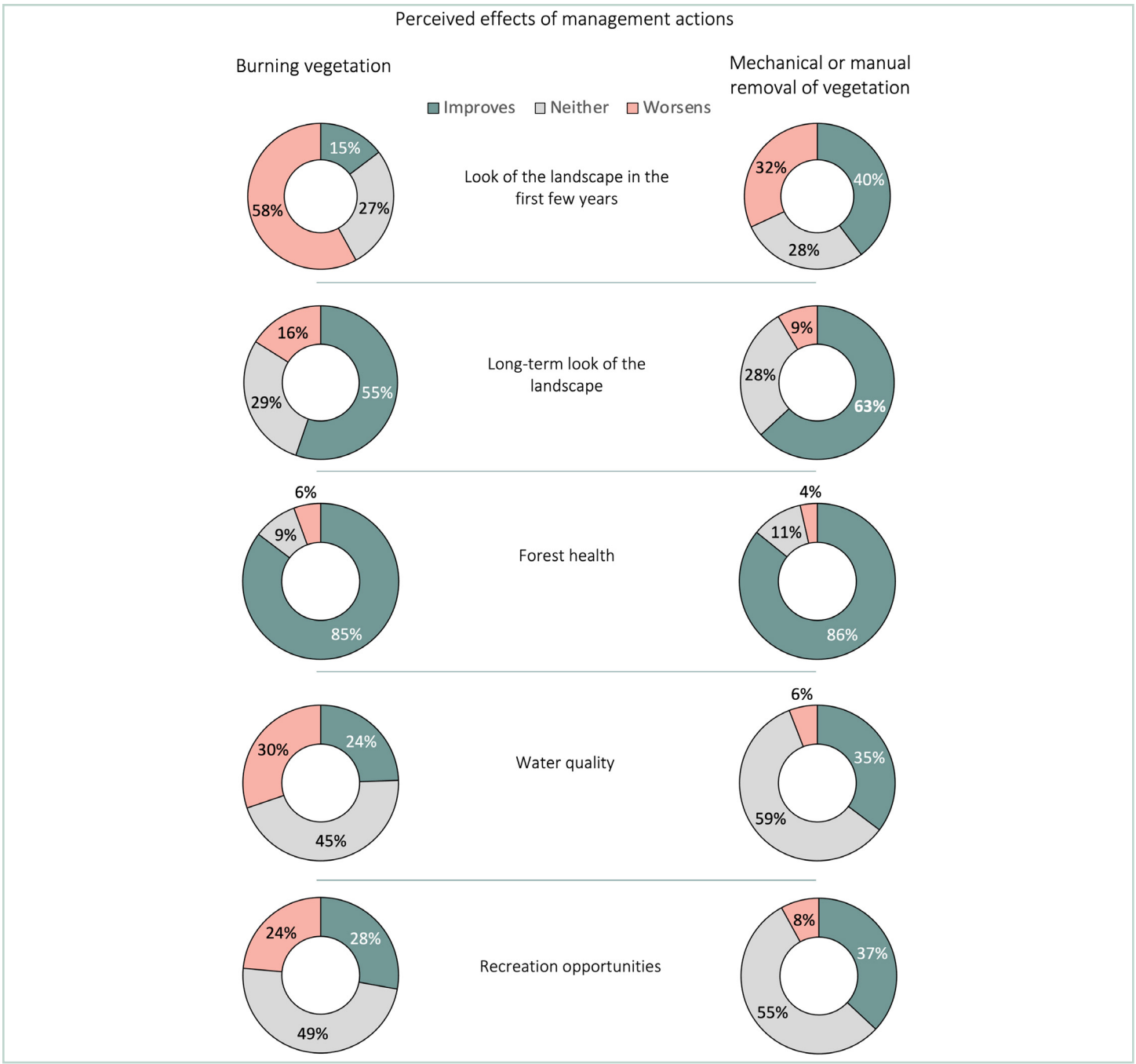

Figure 48—Perceived effects of two management approaches to reducing vegetation – burning and manual/mechanical removal – on the look of the landscape in the first few years, the long-term look of the landscape, forest health, water quality, and recreation opportunities, as reported in 2023 by respondents residing in the Lake County, Colorado, study area. N = 139–143 respondents for effects of burning vegetation and N = 136 to 141 for effects of manual/mechanical removal of vegetation.

Conclusion

This report presents the results of two data collection efforts—a parcel-level wildfire risk assessment and household survey—in the Lake County, Colorado study area. The paired data from the WiRe RA and household survey allowed us to identify differences in how survey respondents and trained assessors evaluated risk attributes. The household survey results highlight the social dimensions of wildfire, including survey respondents' perceptions of wildfire risk and responsibility for wildfire risk reduction, perceptions of public land management strategies and policies for wildfire risk mitigation, current mitigation and evacuation preparedness activities, barriers and incentives to mitigation, and communication preferences. Twenty-four percent of homeowners in the Lake County, Colorado study area completed the household survey.

The majority of survey respondents reported being somewhat or very aware of wildfire risk when they purchased their home. Despite nearly all respondents having no prior experience with wildfire at their Lake County home (figs. 18–20), many respondents have taken action to reduce risk on their property (fig. 34). The data indicate that survey respondents identify vegetation on their property as one of the main contributors to their wildfire risk (fig. 26), believe their efforts to reduce wildfire are effective, understand the importance of reducing wildfire risk on their property (fig. 47), and report facing few barriers to conducting wildfire mitigation (figs. 35–38). However, survey respondents' evaluations of their overall wildfire risk were lower on average than those observed in the WiRē RA data (fig. 4). A notable gap was found between the survey and WiRē RA data regarding defensible space. Respondents estimated greater distances from their homes to overgrown vegetation and to other non-vegetative combustibles compared to trained assessors (figs. 9–10). This discrepancy may present an opportunity for public education on defensible space, specifically focused on managing vegetation and other combustibles in the home ignition zone. Results also indicate respondents may benefit from education about the mechanisms of home ignition, particularly the possibility of ember-driven ignition (fig. 25). Increased awareness of these risks could help inform how residents approach mitigation.

Additionally, while more than half of respondents reported having an evacuation plan (fig. 32), about half or fewer have completed several key evacuation preparedness actions (fig. 33). A quarter of respondents have identified how they would receive evacuation notifications, and less than a quarter have signed up for emergency alerts. Since these two actions had the highest percentage of respondents indicating interest in additional information, residents may benefit from targeted messaging on emergency preparedness, including specific guidance on signing up for emergency notifications.

Survey results also indicate acceptance of wildfire risk reduction at the landscape level, on public lands. Results indicate high acceptability of fuel treatment options, especially for removing trees and reducing other vegetation, removing vegetation along roadways for safer evacuation, burning piles of vegetation, and creating fuel breaks (fig. 42). Survey respondents also indicated broad support for adoption of some codes or regulations in fire-prone areas. However, half of respondents were less accepting of temporarily shutting off the power grid during extreme fire risk days to avoid new wildfire ignitions (fig. 43).

Outreach efforts to educate residents about wildfire mitigation, preparedness, or upcoming fuel treatment projects may be most effective when delivered through sources respondents

currently receive and find useful (fig. 30), as well as through their preferred communication channels (fig. 31). While no single source was received by more than 41 percent of respondents, the top five sources considered extremely or very useful were the CSFS (e.g., Live Wildfire Ready Program), Arkansas River Watershed Collaborative, Lake County Office of Emergency Management, Forest Service (San Isabel National Forest), and LLCFR. Given respondents' most preferred communication channels were email or e-newsletters, followed by mailed newsletters and conversations with local wildfire specialists (fig. 31), distributing information via these channels may be most effective. Additionally, more than half of respondents indicated that receiving a report describing their property's wildfire risk factors would incentivize them to take mitigation actions. Nearly half of respondents also reported a one-on-one visit with a wildfire risk expert on their property would be an incentive for conducting mitigation (fig. 40). Informed by these data, the CSFS and the LLCFR collaborated with WiRē to create a two-page community outreach flyer focused on emergency preparedness and wildfire mitigation information and resources (refer to Appendix F).

References

Meldrum, J.R.; Barth, C.M.; Goolsby, J.B.; Olson, S.K.; Gosey, A.C.; White, J.; Brenkert-Smith, H.; Champ, P.A.; Gomez, J. 2022. Parcel-level risk affects wildfire outcomes: Insights from pre-fire rapid assessment data for homes destroyed in 2020 East Troublesome Fire. Fire. 2022. 5(1): 24. https://doi.org/10.3390/fire5010024

Appendix A: Correspondence Materials and Household Survey

COLORADO STATE FOREST SERVICE
COLORADO STATE UNIVERSITY
CSFS Salida Field Office
7980 West Highway 50
Salida, CO 81201-9858
719-539-2579

Dear Lake County Resident,

We have recently seen the devastating effects of wildfire in our State and those nearby. It is our goal to be proactive in confronting wildfire before another disaster occurs. Due to numerous factors the Greater Leadville area has been identified by Local, County, State, and Federal Agencies as a high-risk area for wildfire. Therefore, the Colorado State Forest Service and our partners are working to help homeowners understand and reduce their risk from wildfire and to learn about the community's current state of wildfire preparedness as well as residents' knowledge, experience, and attitudes. Our investigation will have two components: parcel-level wildfire risk assessments and a mail-in survey.

Wildfire Risk Assessment
In the coming weeks, the Colorado State Forest Service will be conducting parcel-level wildfire risk assessments from the sidewalk or street to determine how residents in the Shavano Front area can be better prepared to survive a wildfire. Parcel-level assessments are a quick overview of the property characteristics that contribute to wildfire risk, including roof type, vegetation density, and evacuation routes.

Living with Wildfire in Lake County in 2022 Survey
The second part of the investigation is a survey that will help us understand your knowledge and perspectives on wildfire. In partnership with the University of Colorado, surveys will be mailed to all households later this year. Your participation in this survey is voluntary, but the information you provide will help emergency responders better prepare for future fires as well as improve our outreach and education efforts.

If you have any questions about this survey, are interested in a more in-depth wildfire risk analysis of your home and property, or wish not to participate please feel free to call Josh Kuehn at 970-294-1117 or email at josh.kuehn@colostate.edu.

Thank you for participating.
Sincerely,

Dan Dailey
Fire Chief
Leadville/Lake County Fire-Rescue

Josh Kuehn
Forester
Colorado State Forest Service

ARWC
ARKANSAS RIVER WATERSHED COLLABORATIVE

University of Colorado Boulder

COLORADO STATE FOREST SERVICE
COLORADO STATE UNIVERSITY

CSFS Salida Field Office
7980 West Highway 50
Salida, CO 81201-9858
719-539-2579

Dear Lake County Resident,

The University of Colorado, the Colorado State Forest Service, Leadville/Lake County Fire-Rescue, and the Wildfire Research (WiRē) Center are partnering to send the "Living with Wildfire in Lake County in 2023" survey to residents of the fire protection district. To create the most effective programs possible, Colorado State Forest Service needs to understand what you know about wildfire, your experiences with wildfire, as well as the characteristics of your property. The information you provide will help Colorado State Forest Service and emergency responders better prepare for future fires as well as improve our outreach and education efforts. Results from the study will be shared with local, state, and federal groups considering wildfire risk management at the conclusion of the project.

Participation in this study is completely voluntary and will take about 20 minutes. We realize your time is valuable and we appreciate you taking the time to fill out the survey.

When you return the survey, your name will be deleted from the mailing list. Survey results will be reported in summary form and your name will not be connected to your answers in any way. After completing the survey, please fold it and put it in the postage paid return envelope. By returning the survey, you are acknowledging you understand your rights as a study participant and providing consent to participate (*please see more details on the back of this letter*).

If you have any questions about the survey, please email Hannah Brenkert-Smith at hannahb@colorado.edu. If you have any questions about the collaborative project, please feel free to call Josh Kuehn at 970-294-1117 or email at josh.kuehn@colostate.edu.

Thank you for participating.
Sincerely,

Hannah Brenkert-Smith
Institute of Behavioral Science
University of Colorado

Dan Dailey
Fire Chief
Leadville/Lake County Fire Rescue

Josh Kuehn
Forester
Colorado State Forest Service

SEAL OF LAKE COUNTY STATE OF COLORADO

LEADVILLE FIRE RESCUE LAKE COUNTY

ARWC
ARKANSAS RIVER WATERSHED COLLABORATIVE

Your Rights as a Participant

We will make every effort to maintain the confidentiality of the study data. We will never publish information about individuals who participate in the study; we will present research results in summary form and keep all records and data secure.

There are no foreseeable risks associated with your participation in the survey.

You may withdraw from the study at any time and for any reason. If you have questions, concerns, or complaints about this research and you would like to talk to the research team, please contact Dr. Hannah Brenkert-Smith at hannahb@colorado.edu. This research has been reviewed and approved by an Institutional Review Board (IRB). You may talk to them at 303-735-3702 or irbadmin@colorado.edu if: your questions, concerns, or complaints are not being answered by the research team; you cannot reach the research team; you want to talk to someone besides the research team; you have questions about your rights as a research subject; or you want to get information or provide input about this research.

Resources to help you prepare for wildfire:

Pack an emergency go bag. Here's a list of what to pack:
https://simplebooklet.com/emergencygobag

Sign up for emergency notifications so you know when to evacuate:
https://member.everbridge.net/892807736726383/login

Prepare your home for wildfire. Here's a list of actions to take:
https://csfs.colostate.edu/wp-content/uploads/2023/04/LWR_Handout_Public.pdf

University of Colorado Boulder

COLORADO STATE FOREST SERVICE
COLORADO STATE UNIVERSITY

CSFS Salida Field Office
7980 West Highway 50
Salida, CO 81201-9858
719-539-2579

Dear Lake County Resident,

We recently requested your participation in an important survey about wildfire. Many residents have completed and returned the survey. However, we would like to hear from you so we can consider your opinions. If you have already returned the survey, thank you for your participation. If you have not yet responded, please complete and return the enclosed survey. Participation in this study is completely voluntary and will take about 20 minutes. We realize your time is valuable and we appreciate you taking the time to fill out the survey.

The "Living with Wildfire in Lake County in 2023" survey is a collaborative effort between the University of Colorado, the Colorado State Forest Service, and the Wildfire Research (WiRē) Center. We need your help to develop more effective community wildfire programs. It is our goal to proactively confront wildfire preparedness issues before the smoke is in the air.

When you return the survey, your name will be deleted from the mailing list. Survey results will be reported in summary form and your name will not be connected to your answers in any way. After completing the survey, please fold it and put it in the postage paid return envelope. By returning the survey, you are acknowledging you understand your rights as a study participant and providing consent to participate (*please see more details on the back of this letter*).

If you have any questions about the survey, please email Hannah Brenkert-Smith at hannahb@colorado.edu. If you have any questions about the collaborative project, please feel free to call J.T. Shaver at 970-596-0841 or email at j.t.shaver@colostate.edu.

Thank you for participating.
Sincerely,

Hannah Brenkert-Smith
Institute of Behavioral Science
University of Colorado

Dan Dailey
Fire Chief
Leadville/Lake County Fire Rescue

J.T. Shaver
Supervisory Forester
Colorado State Forest Service

SEAL OF LAKE COUNTY STATE OF COLORADO

LEADVILLE FIRE RESCUE LAKE COUNTY

ARWC
ARKANSAS RIVER WATERSHED COLLABORATIVE

Your Rights as a Participant

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You may withdraw from the study at any time and for any reason. If you have questions, concerns, or complaints about this research and you would like to talk to the research team, please contact Dr. Hannah Brenkert-Smith at hannahb@colorado.edu. This research has been reviewed and approved by an Institutional Review Board (IRB). You may talk to them at 303-735-3702 or irbadmin@colorado.edu if: your questions, concerns, or complaints are not being answered by the research team; you cannot reach the research team; you want to talk to someone besides the research team; you have questions about your rights as a research subject; or you want to get information or provide input about this research.

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CSFS Salida Field Office
7980 West Highway 50
Salida, CO 81201-9858
719-539-2579

Dear Lake County Resident,

We recently sent you the “Living with Wildfire in Lake County in 2023” survey. If you have not had a chance to complete and mail the survey, please do so today. We value your opinions. The information you provide is very important for the development of programs to reduce the risk of losses due to catastrophic wildfires.

If you have recently returned the survey, thank you for your participation!

Sincerely,

Hannah Brenkert-Smith
Institute of Behavioral Science
University of Colorado

Dan Dailey
Fire Chief
Leadville/Lake County Fire Rescue

Josh Kuehn
Forester
Colorado State Forest Service

Living with Wildfire in Lake County in 2023

Colorado State Forest Service
Salida Field Office
7980 West Highway 50
Salida, CO 81201

Section 1: In this first section of the survey, we ask about your home in Lake County. Please answer the following questions with respect to your ***Lake County home***.

When choosing a response, please fill in the circle completely. Correct: ● Incorrect: ⊘ ◉ ◔

1.1. Do you own or rent your Lake County home? (*Fill in one circle*)

- ○ Own: primary home
- ○ Own: secondary home
- ○ Rent: I do not own this home

1.2. In a typical year, what months do you spend any time at your Lake County home? (*Fill in all that apply*)

All 12 months	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	No months
○	○	○	○	○	○	○	○	○	○	○	○	○	○

1.3. Do you rent out your Lake County home to others? (*Fill in one circle*)

- ○ No, I do not rent out my home
- ○ Yes, I rent out my home short-term
- ○ Yes, I rent out my home long-term

1.4. In what year did you move to your Lake County home? (Fill in the blank)

_____ Year moved to my Lake County home

1.5. In what year was your Lake County home originally built? (*Fill in the blank*)

_____ Year my Lake County home was built

1.6. How aware of wildfire risk were you when you bought or decided to rent your Lake County home? (*Fill in one circle*)

- ○ Very aware
- ○ Somewhat aware
- ○ Not aware
- ○ Don't remember

Section 2: In this section, we ask about your experience with, and preparation for, wildfire at your Lake County home.

2.1. What is the closest distance (as a crow flies) a wildfire has come to your Lake County property? (*Fill in one circle*)

- ○ There has been a wildfire on my property
- ○ Less than 2 miles away, but not on my property
- ○ 2 to 10 miles away
- ○ More than 10 miles away
- ○ Not sure

2.2. Have you had any of the following wildfire experiences at your Lake County home? (*Fill in one circle per row*)

	No	Yes
I have evacuated from my Lake County home due to a wildfire	○	○
My Lake County home has had wildfire smoke damage	○	○
My Lake County home has had wildfire damage	○	○
My Lake County home was destroyed by a wildfire	○	○

2.3. Do you currently have an evacuation plan in the event a wildfire threatens your Lake County home? (*Fill in one circle per row*)

	No	Yes	Not applicable
For the people in my household	○	○	
For the pets in my household and on my property	○	○	○
For livestock on my property	○	○	○

2.4. Have you completed any of the following actions to prepare for a **wildfire evacuation,** and do you want more information about how to complete any of the actions? (*Fill in all circles that apply*)

	Completed action	Want more information
Identify how I will be notified about an evacuation	○	○
Sign up for a wildfire evacuation notification system (Everbridge Emergency Alert Program)	○	○
Identify safe evacuation routes (multiple, if possible)	○	○
Identify a location that my household will evacuate to	○	○
Identify what to take and what to leave behind during an evacuation	○	○
Discuss evacuation with my neighbors	○	○
Create a checklist for steps to take before evacuating	○	○
Identify a place to stay during a long-term evacuation	○	○
Pack a "go bag" with items needed during an evacuation	○	○
Provide evacuation information to renters, if applicable	○	○

2.5. Please tell us about your experiences with your **homeowners insurance** for your Lake County home. (*Fill in one circle per row*)

	No	Yes	Don't know
Do you currently have homeowner's insurance?	○	○	
Has an insurance company ever provided information on reducing wildfire risk?	○	○	○
Has an insurance company ever refused to provide or renew insurance because of wildfire risk?	○	○	○
Has an insurance company charged a higher premium because of wildfire risk?	○	○	○
Has an insurance company ever given you a discount on your premium because you have reduced wildfire risk on your property?	○	○	○
Do you think your home is adequately insured against loss from a wildfire?	○	○	○
Has an insurance company ever required you to take action to reduce wildfire risk in order to continue coverage?	○	○	○
Has an insurance company offered private firefighting services?	○	○	○

Section 3: In this section, we ask about the characteristics of your Lake County home and the area near your Lake County home.

3.1. Does your Lake County home have any of the following roofing materials? (*Fill in all that apply*)

- ○ Tile, metal, or asphalt shingles
- ○ Wood (shake shingles)

3.2. Does your Lake County home have any of the following exterior siding materials? (*Fill in all that apply*)

- ○ Noncombustible siding (tile, metal, brick, asphalt)
- ○ Log or heavy timbers
- ○ Maintained wood
- ○ Weathered wood or vinyl

3.3. Does your Lake County home have a **combustible** balcony, deck, porch, or fence attached to the structure? (*Fill in one circle*)

- ○ No
- ○ Yes

3.4. What is the **closest** distance from your Lake County home to combustible items other than vegetation such as lumber, firewood, a propane tank, hay bales, flammable outdoor furniture, or other materials that could easily ignite, including an outbuilding/shed, detached garage, or other structure on your property? (*Fill in one circle*)

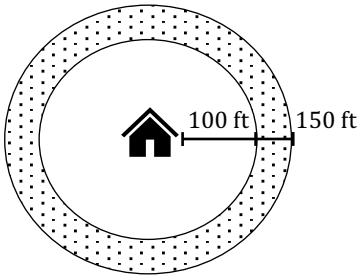
- ○ More than 30 feet or no combustible items
- ○ 10 – 30 feet
- ○ 5 – 9 feet
- ○ Less than 5 feet

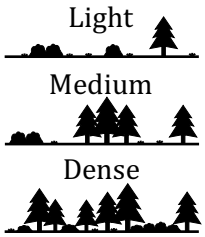
3.5. What is the **closest** distance from your Lake County home to overgrown, dense, or unmaintained vegetation? (*Fill in one circle*)

- ○ More than 100 feet
- ○ 30 – 100 feet
- ○ 5 – 29 feet
- ○ Less than 5 feet

3.6. Which of the following best describes the **majority** of vegetation on your Lake County property between 100 and 150 feet from your home (the shaded part of the circle in the figure below)? That area might be outside your property boundary and include properties immediately surrounding you. (*Fill in one circle*)

- ○ Light: Grasses with isolated brush
- ○ Medium: Sparse brush and/or isolated trees (e.g., Lodgepole/aspen mix, thinned lodgepole stands with canopy separation)
- ○ Dense: Dense brush and/or dense trees (e.g., continuous closed canopy lodgepole pine)



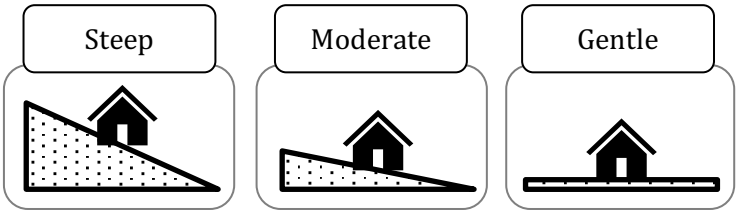


3.7. What is the **closest** distance from your Lake County home to a neighboring home outside of your property? (*Fill in one circle*)

- ○ More than 100 feet
- ○ 30 – 100 feet
- ○ 10 – 29 feet
- ○ Less than 10 feet

3.8. The slope of a property refers to the steepness of the land. A large property may have steep, moderate, and gentle slopes. How would you describe the average slope **within 150 feet** of your Lake County home? (*Fill in one circle*)

- ○ Steep – Greater than 45%
- ○ Moderate – 20% to 45%
- ○ Gentle – Less than 20%



3.9. What is the **closest** distance from your Lake County home to a ridge, steep drainage, or narrow canyon? (*Fill in one circle*)

- ○ More than 150 feet
- ○ 50 – 150 feet
- ○ Less than 50 feet

3.10. Do any of the following describe your driveway? My driveway... (*Fill in one circle per row*)

	No	Yes
has an overhead obstruction (e.g., tree limbs) lower than 15 feet	○	○
is narrower than 20 feet wide	○	○
is longer than 150 feet	○	○
has room for a fire truck to turn around	○	○

3.11. Do any of the following describe your address number? My address number… (*Fill in one circle per row*)

	No	Yes
is posted at the end of my driveway?	○	○
is reflective?	○	○
has 4-inch numerals?	○	○
is on a contrasting background (white letters on blue background)?	○	○
is made of noncombustible materials?	○	○

3.12. If the road you use to access your Lake County home was blocked during a wildfire, is there another road you could use to get out of your community? (*Fill in one circle*)

- ○ No
- ○ Yes

3.13. Properties in your community are assessed for overall wildfire risk based on the items asked about in questions 3.1 – 3.12 above. What do you think is your Lake County property's current overall wildfire risk rating? (*Fill in one circle*)

- ○ Low risk
- ○ Moderate risk
- ○ High risk
- ○ Very high risk
- ○ Extreme risk

Section 4: In this section, we ask about wildfire risk reduction activities.

4.1. Have you ever talked about wildfire issues with a neighbor? (*Fill in one circle*)

○ No

○ Yes

4.2. Have you done any of the following wildfire-related activities? (*Fill in one circle per row*)

	No	Yes
Removed large or dense vegetation near my Lake County home (e.g., trees, shrubs, brush)	○	○
Regularly cleared my roof and gutters of leaves and pine needles	○	○
Regularly mowed and raked around my Lake County home	○	○
Made my Lake County home more fire resistant (e.g., replaced roofing, siding, added hardscaping, added screening under eaves)	○	○
Helped neighbor(s) reduce vegetation on their properties	○	○
Helped reduce vegetation on community property (e.g., HOA, subdivision)	○	○
Reduced vegetation on nearby public lands (e.g., county, state, federal lands)	○	○
Participated in a community wildfire preparedness activity (e.g., meeting, chipper day)	○	○
Met with a wildfire professional at my Lake County home to evaluate and discuss my property's wildfire risk	○	○
Participated in a cost share program to reduce vegetation and wildfire risk	○	○
Interacted with public land managers (e.g., Colorado State Forest Service or U.S. Forest Service) about fuels reduction on nearby public lands	○	○
Applied for a Burn Permit in 2023	○	○

4.3. How much do you think each of the following factors increases the chances of a wildfire damaging your Lake County property **in the next 12 months**? (*Fill in one circle per row*)

	A lot	Somewhat	Not at all
Vegetation on my property	○	○	○
Physical characteristics of my house or other buildings (e.g., roofing or siding) on my property	○	○	○
Vegetation on my neighbors' properties	○	○	○
Vegetation on nearby public or large undeveloped land	○	○	○
Lack of nearby water supply (e.g., hydrant or cistern) for fire suppression	○	○	○

4.4. How many of your immediate neighbors have taken action to reduce wildfire risk on their properties (e.g., removing vegetation or replacing combustible siding)? (*Fill in one circle*)

- ○ All my neighbors have taken action
- ○ Most of my neighbors have taken action
- ○ Some of my neighbors have taken action
- ○ None of my neighbors have taken action

4.5. How acceptable are the following land management approaches to **reducing wildfire risk** in Lake County to you? (*Fill in one circle per row*)

	Extremely acceptable	Very acceptable	Moderately acceptable	Slightly acceptable	Not at all acceptable
Removing trees and other vegetation (thinning) on nearby public lands	○	○	○	○	○
Creating a fuel break on nearby public lands by removing all trees in a strip/corridor next to a community or other values at risk	○	○	○	○	○
Removing all trees in a defined area (about 2 to 6 acres) on nearby public lands (patch cut)	○	○	○	○	○
Removing trees and other vegetation along roadways for safer evacuation and emergency response	○	○	○	○	○
Burning piles of vegetation (slash piles) on nearby public lands	○	○	○	○	○
Conducting a prescribed fire ignited by fire professionals on nearby public lands	○	○	○	○	○
Allowing a naturally ignited fire to burn on nearby public lands, when and where appropriate	○	○	○	○	○
Removing trees and other vegetation on HOA property surrounding communities	○	○	○	○	○
Burning piles of vegetation (slash piles) on my or nearby *private* land	○	○	○	○	○

4.6. Land management actions to reduce wildfire risk can be grouped into two approaches: (1) burning vegetation and (2) manual or mechanical vegetation removal. How will these two approaches affect the following? *(Fill in two circles per row, one for each approach)*

	Approach 1: Burning vegetation			**Approach 2: Manual/mechanical vegetation removal**		
	Improves	Neither improves nor worsens	Worsens	Improves	Neither improves nor worsens	Worsens
Look of landscape in the first few years	○	○	○	○	○	○
Long-term look of the landscape	○	○	○	○	○	○
Forest health	○	○	○	○	○	○
Water quality	○	○	○	○	○	○
Recreation opportunities	○	○	○	○	○	○

4.7. How acceptable are the following policy or regulatory approaches to **reducing wildfire risk** in Lake County to you? (*Fill in one circle per row*)

	Extremely acceptable	Very acceptable	Moderately acceptable	Slightly acceptable	Not at all acceptable
Growth policies or land use regulations that limit new development in fire-prone areas in Lake County	○	○	○	○	○
Building codes that require fire resistant materials for structures located in fire-prone areas	○	○	○	○	○
Development standards that require vegetation management (e.g., removing trees and mowing grass) on lots located in fire-prone areas	○	○	○	○	○
Temporarily shutting off the power grid during extreme fire risk days to avoid wildfire ignitions	○	○	○	○	○

Section 5: In this section, we ask about your notions, expectations, and risk perceptions related to wildfire.

5.1. How much do you agree or disagree with the following statements about wildfire? (*Fill in one circle per row*)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
With proper technology, we can control most wildfires.	○	○	○	○	○
We should put out wildfires that threaten human life.	○	○	○	○	○
We should put out wildfires that threaten homes.	○	○	○	○	○
During a wildfire, saving homes should be a priority over saving forests.	○	○	○	○	○
Wildfires are a natural part of a healthy forest/ecosystem.	○	○	○	○	○
I live here for the trees and will not remove any of them to reduce wildfire risk.	○	○	○	○	○
Managing the wildfire danger is a government responsibility, not mine.	○	○	○	○	○
Homeowners' actions to reduce wildfire are not effective.	○	○	○	○	○
My property is at risk of wildfire.	○	○	○	○	○
My effort to reduce wildfire risk on my property is not effective because of the heavy vegetation on my neighbors' properties.	○	○	○	○	○
Local firefighters have sufficient resources to keep a wildfire from spreading.	○	○	○	○	○
Local firefighters have sufficient resources to protect threatened homes.	○	○	○	○	○
Firefighters should put their lives at risk to protect my home.	○	○	○	○	○
Wildfires threaten my community water supply.	○	○	○	○	○
I plan to move out of the area in the next 12 months because of wildfires.	○	○	○	○	○
Development in fire-prone areas of Lake County increases the wildfire risk to my Lake County property.	○	○	○	○	○

5.2. If there is a wildfire on your Lake County property, how likely do you think it is that the following would occur? (*Fill in one circle per row*)

	Extremely likely	Very likely	Moderately likely	Slightly likely	Not at all likely	Not applicable
I would put the fire out.	○	○	○	○	○	○
The fire department would save my home.	○	○	○	○	○	○
My home would have smoke damage.	○	○	○	○	○	○
My home would have some physical damage.	○	○	○	○	○	○
My home would be destroyed.	○	○	○	○	○	○
I would lose money due to the loss of business or income on my property.	○	○	○	○	○	○
My trees and landscape would burn.	○	○	○	○	○	○
My neighbors' homes would be damaged or destroyed.	○	○	○	○	○	○
Direct flame would ignite my home.	○	○	○	○	○	○
Embers would ignite my home.	○	○	○	○	○	○
Nearby homes would ignite my home.	○	○	○	○	○	○

5.3. What do you think is the chance that a wildfire will be on your Lake County property **in the next 12 months**? (*Fill in one circle*)

For sure — No chance

100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
○	○	○	○	○	○	○	○	○	○	○

5.4. If there is a wildfire on your property **in the next 12 months**, what do you think is the chance that it will destroy or severely damage your Lake County home? (*Fill in one circle*)

For sure — No chance

100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
○	○	○	○	○	○	○	○	○	○	○

Section 6: In this section, we ask where you get information about wildfire, how useful the information is, how you receive information, and how you would like to receive information.

6.1. The following sources provide information about wildfire risk. If you have received information from one of these sources, how useful has it been? (*Fill in one circle per row*)

	Extremely useful	Very useful	Moderately useful	Slightly useful	Not at all useful	Fill in this circle if you have **NOT** received information from this source
Leadville/Lake County Fire Rescue	○	○	○	○	○	○
Community group (e.g., homeowners association)	○	○	○	○	○	○
Community wildfire ambassador	○	○	○	○	○	○
Local arborist/contractor	○	○	○	○	○	○
Lake County Office of Emergency Management	○	○	○	○	○	○
Local government	○	○	○	○	○	○
Arkansas River Watershed Collaborative	○	○	○	○	○	○
Firewise USA®	○	○	○	○	○	○
Ready, Set, Go! Program	○	○	○	○	○	○
Colorado Parks and Wildlife	○	○	○	○	○	○
Colorado State Forest Service (e.g., Live Wildfire Ready Program)	○	○	○	○	○	○
USDA Forest Service (San Isabel)	○	○	○	○	○	○
National Park Service	○	○	○	○	○	○
Bureau of Land Management	○	○	○	○	○	○
Media (newspaper, TV, radio, internet)	○	○	○	○	○	○

6.2. How do you currently receive information about wildfire risk reduction, and how would you prefer to receive information? (*Fill in all circles that apply*)

	I receive information from this source	I would like to receive information from this source
Email/e-newsletter	○	○
Mailed newsletter	○	○
Community meetings	○	○
Conversations with local wildfire specialists	○	○
Social media (Facebook, Twitter, Nextdoor)	○	○
Internet (non-social media)	○	○
TV news	○	○
Newspaper	○	○
Radio	○	○

Section 7: In this section, we would like to know why you do or do not take action to reduce the risk of wildfire to your Lake County property.

7.1. Do any of the following **prevent you** from taking action to reduce the wildfire risk on your Lake County property (e.g., cutting trees, changing roof/siding)? (*Fill in all that apply for each row*)

Personal	Financial cost ○	Time to do the work ○	Physical ability to do the work ○	None of these ○
Lack of specific information about…	The factors contributing to my property's wildfire risk ○	How to reduce wildfire risk on my property ○	Where to dispose of vegetation/slash ○	None of these ○
Personal	I do not want to change the way my property looks ○	I do not think taking action would reduce my property's wildfire risk ○	It's a low priority to me ○	None of these ○
Community	Lack of options for disposing vegetation/slash ○	Restrictions on the changes I can make to my property ○	Social pressure from neighbors ○	None of these ○

7.2. Would any of the following **encourage you** to take action to reduce the wildfire risk on your Lake County property? (*Fill in all that apply for each row*)

Resources	Cost-share or financial assistance ○	Help doing the work ○	Recommended contractors ○	None of these ○
Information	A report describing my property's wildfire risk factors ○	Videos showing how to reduce risk on a property in my area ○	One-on-one visit with wildfire risk experts on my property ○	None of these ○
Other	Feedback on the work I've done to reduce my property's risk ○	Recognition for taking action ○	Neighborhood group that organizes wildfire risk-reduction activities ○	None of these ○

Section 8: In this section, we ask about personal and household characteristics. Your name will never be connected to your answers in any way.

8.1. In general, do you view yourself as someone who is very willing to take risks or not at all willing to take risks? (*Fill in one circle*)

Very willing to take risks										Not at all willing to take risks
10	9	8	7	6	5	4	3	2	1	0
○	○	○	○	○	○	○	○	○	○	○

8.2. What is your age? (*Fill in the blank*)

_____ years old

8.3. Are you? (*Fill in one circle*)

○ Male

○ Female

○ Other

8.4. What is the highest grade or year of school you completed? (*Fill in one circle*)

○ Less than high school

○ High school graduate

○ Some college or technical school

○ Technical or trade school

○ College graduate

○ Some graduate work

○ Advanced degree (M.D., M.A., M.S., Ph.D., etc.)

8.5. Which of the following best describes your current employment situation? (*Fill in one circle*)

- ○ Employed full time (including self-employed)
- ○ Employed part time (including self-employed)
- ○ Unemployed or do not work outside of the home
- ○ Retired

8.6. Which of the following categories describes your annual household income? (*Fill in one circle*)

- ○ Less than $24,999
- ○ $25,000 – $49,999
- ○ $50,000 - $74,999
- ○ $75,000 - $99,999
- ○ $100,000 - $199,999
- ○ $200,000 or more

Thank you for your help. Please use the space below to write any additional comments. Refer to the cover letter included in your mailing for contact information if you would like to schedule an onsite visit with a wildfire professional to learn how you can reduce risk on your property.

Appendix B: Wildfire Research (WiRē) Assessor Reference Guide and Data Collection Tool Instructions

Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Assessor Reference Guide

Table of Contents

What is in this guide?

The WiRē Rapid Wildfire Risk Assessment (RA) is comprised of 13 attributes that include access to the property, background fuels and topography, vegetation near the home, and building materials. Each attribute of the RA is evaluated relative to other private land parcels within the study area. As a result, the RA serves as an indicator of the relative risk of private land parcels within the study area, rather than an absolute measure of risk.

The 13 attributes are weighted and summed to produce an overall risk score for each parcel. The weights reflect the attributes' relative contribution (ranging from 1% - 30% per attribute) to overall wildfire risk, based on a 1000-point scale.

This guide provides assessors with a comprehensive guide to conducting RAs using the standard WiRē format. In Section 1, we provide the **Rapid Assessment Instructions**, guidance on how to choose which response category best reflects the condition observed at the parcel. In Section 2, we provide **Data Collection Tool Instructions** that provide detailed instructions on the mechanics of using the data collection tool. Lastly, in Section 3, we present the **Rapid Assessment Scoring** that presents the risk score for each attribute response category, the weight of the attribute within the overall risk score, and the score ranges included in each risk rating.

1 Rapid Assessment Instructions

This section presents guidance on how to choose which response category best reflects the condition observed at the parcel. Because this is a 'drive-by assessment', some of the attributes

may be unobservable. For example, if the back of the house is not visible from the road, several attributes will be unobservable (e.g., combustible attachments, other combustibles). For these instances, we include an additional response category "unknown/not observed" for all the risk attribute questions (excluding address posting, since it is observable from the road).

During data processing, we retain the unobserved status and include the attribute in the risk score by assigning the highest risk score for the attribute in question. This is consistent with other parcel risk and structure protection assessments. If a particular attribute is "unknown/not observed" or missing, practitioners and firefighters assume that a hazard exists. At best, the correct attribute response is chosen; at worst, the assessment invites a conversation with the parcel owner to delve deeper into the mitigation needs of the parcel in question and an update to their parcel risk assessment. If you observe the attribute, but are unsure of the correct response category, choose the riskiest option.

In the remainder of this section, we present a set of tables (Tables 1 to 5, respectively) organized by the categories: general information, access, background conditions, defensible space, and home ignition potential. Each table includes the following:

- Background information about the risk attribute,
- the response categories and associated risk scores,
- additional information on how to select a response category for a given property.

Table 1. General information

Attribute (variable name)	Response categories	Attribute suggestions
Assessor name (assessor)		
Who is the assessor?	Josh Kuehn	Select your name from the drop-down menu.
	David McCann	
	Andy Lerch	
	Cassidy Dzekciorius-Bailey	
	Dan Dailey	
	Other	
Type of structure (structype) *This variable helps WiRē understand whether to send a household survey to the parcel. As part of the WiRē process, we only send household surveys to properties that contain a residential structure.*		
What is the primary use of this structure?	Residential	Select the structure type that best reflects that observed use. For example, is it used as a home or living area (Residential), is it used as a business (Commercial), is it used to manufacture goods or a type of industrial site (Industrial)?
	Commercial	
	Industrial	
	Mixed use	
	No structure/ vacant lot	
	Other	
Water source (water_source)		
Are there water sources on the property or in close proximity that are adequate for suppression resources to use (engines, tenders, helicopters)?	No	Examples: hydrants, cisterns, ponds, streams. Water source is available in the summer.
	Yes	
	Unknown – not observed	If you cannot observe the attribute at all, choose "Unknown – not observed."

Table 1. General information

Attribute (variable name)	Response categories	Attribute suggestions
Other (other)		
Items that were not captured in the risk rating evaluation that may increase the wildfire risk.	None Low Medium High	Ex. Dense vegetation along roads/driveways affecting evacuation routes.
Comment		
Enter necessary comments about a structure that will help you understand the data. WiRē does not generally use this field.	Not applicable	Examples of when to enter comments: If there are multiple structures on a parcel, please note which structure is the primary or secondary residence.

Table 2. Risk attributes related to access

Risk attribute (variable name)	Response categories	Score	Attribute measurement suggestions
Address posting (address) *A clearly visible address sign, that remains visible in the dark (e.g., night, smoky) is critical for safe and effective emergency response, particularly for EMS.*			
Does the address sign meet the standards? - Posted at the end of the driveway - Reflective - Has 4-inch numerals - On a contrasting background - Made of noncombustible materials	**Fully** meets standard	0	Use this category if the address sign fully meets or exceeds the standards.
	Address sign is visible, but **does not meet all** standards	5	Use this category if the address sign is visible from the road but does not meet all standards (ex: it is not reflective).
	Not posted or visible from the road	10	Use this category if the address sign either (A) does not appear to exist or (B) is not visible.
Ingress/Egress (roads) *Safe and effective ingress and egress is a critical component to community planning as well as emergency response and evacuation.* *In certain locations there may be more than one road out from the immediate house, but over some distance, these multiple roads may funnel into a single ingress/egress route. It will be up to the assessor's discretion (and should be standardized across assessors prior to beginning data collection) to determine what is considered a viable route to a safe location.*			
If the road to access the home was blocked due to a wildfire, is there another road to get out of the community?	**Two** or more roads in/out	0	Use this category if the property has more than one ingress/egress route that reaches a location considered safe in the event of a wildfire.
	One road in/out	10	Use this category if the property has just one ingress/egress route that reaches a location considered safe in the event of a wildfire.
	Unknown - not observed	10	If you cannot observe the attribute at all, choose "Unknown - not observed."

Table 2. Risk attributes related to access

Risk attribute (variable name)	Response categories	Score	Attribute measurement suggestions
Driveway clearance (drivewayclr) *The rationale behind this attribute is related to emergency access, and in particular, access to the property by wildland fire engines, structure fire apparatus, and other emergency responders. Under ideal circumstances, each driveway should provide enough horizontal width so that two vehicles can easily pass one another along the driveway and enough vertical clearance so fire apparatus is able to pass though.* *NOTE: this table currently presents the general standards and will be customized to include the local standards of the community*			
Does the driveway meet the following clearance standards: at least 13.5' high and 20' wide?	Meets **all** driveway standards (height and width)	0	**Height (vertical standard)**: Overhanging tree branches or ranch-style gateways can create vertical obstructions. The vertical standard for this assessment is 13.5 feet. **Width (horizontal standard)**: Width refers to horizontal obstruction-free clearance that would permit vehicle access, not just road base. For example, if driveway road base is 12' wide and bordered by flat ground that could easily be driven on by any firefighting vehicle, with no obstructions for at least 4' on each side (20' total), driveway meets width standard.
	Meets one, but not both, standards (height or width)	5	
	Does not meet either standard (height and width)	10	
	Unknown - not observed	10	If you cannot observe the attribute at all, choose "Unknown - not observed."
Driveway length (drivewaylen) *The longer the driveway, the more risk exposure for responders.* *If a local FPD/county/local jurisdictional standard for emergency vehicle turnarounds does not exist, your jurisdiction may elect to develop a standard—whether or not there is a strict requirement for homeowners to meet the standard.*			
What best describes the driveway?	Less than 150' long	0	Length may be estimated by visual estimate or by driving down the driveway.
	150' or more **with** "adequate" turnaround	5	"Adequate" indicates that a turnaround exists that meets or exceeds the local FPD/county/relevant jurisdictional standards for emergency vehicle turnarounds.
	150' or more **without** "adequate" turnaround	10	
	Unknown - not observed	10	If you cannot observe the attribute at all, choose "Unknown - not observed."

Table 3. Risk attributes related to background conditions

Risk attribute (variable name)	Response categories	Score	Attribute measurement suggestions
Distance to dangerous topography (topo) *Topography is one of the three main factors that influence wildland fire behavior. It is well documented and understood that certain topographic features, such as ridges, chimneys, and drainages are known to dramatically increase fire behavior (rate of spread, flame length, etc.). As such, homes that are located close to, and in direct alignment with, these features are at significantly higher risk than those homes that are situated back and away from such features.* *Topography has a perceived overlap with slope; however, slope is designed to capture the "grade" of the land rather than specific topographic features.*			
What is the closest distance from the home to a ridge, steep drainage, or narrow canyon?	More than 150'	0	The goal of this attribute is to assess the relative proximity of the home to any observed topographical feature.
	50' - 150'	25	
	Less than 50'	50	
	Unknown - not observed	50	If you cannot observe the attribute at all, choose "Unknown - not observed."

Table 3. Risk attributes related to background conditions

Risk attribute (variable name)	Response categories	Score	Attribute measurement suggestions
Slope (slope) *The overall slope of the land where the home is situated has a significant influence in how wildfire will likely behave. While the arrangement of fuels (type, moisture levels, vertical continuity, horizontal continuity, etc.), aspect and incident specific weather conditions will also become significant factors, we know that as slope increases, the potential for elevated fire behavior characteristics increases correspondingly.*			
The slope of a property refers to the steepness of the land. A large property may have steep, moderate, and gentle slopes. How would you describe the slope **within 150 feet of the home**?	Gentle - less than 20%	0	Slope is a measurement of the vertical rise between at least two points. To maintain consistency, we recommend that each assessor utilize the same methodology for estimating slope. The recommended methodology is as follows: Draw an imaginary transect that is 300 feet in length with the home at the center of the transect. There will then be 150 feet of distance along the transect, in either direction, from the center of the home. Orient the transect perpendicular to the contours of the slope. Please note that the transect must be a straight line. If numerous undulations/topographic complexities exist, do your best to make an estimate of the overall lay of the land within approximately 150 feet of the home. **PLEASE NOTE THE DIFFERENCE BETWEEN PERCENT SLOPE AND DEGREES.**
	Moderate - between 20% - 45%	10	
	Steep - greater than 45%	20	
	Unknown - not observed	20	If you cannot observe the attribute at all, choose "Unknown - not observed."

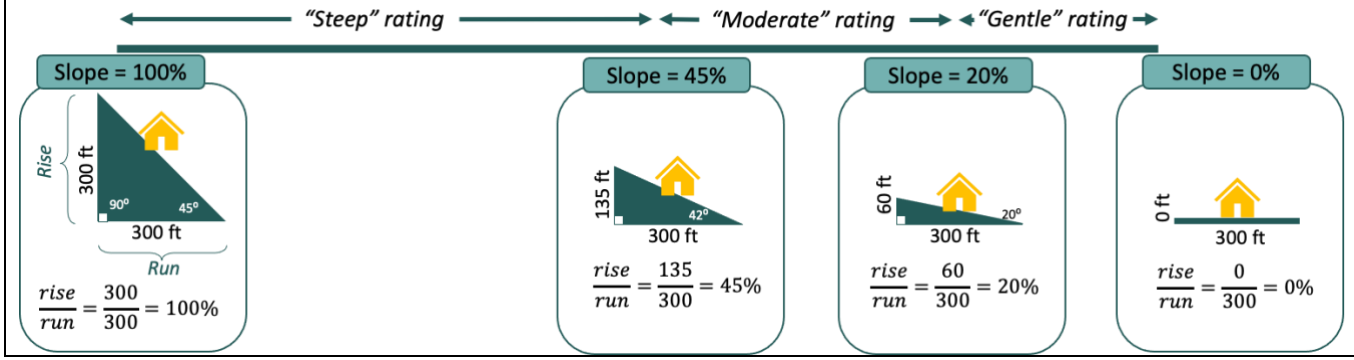


Table 3. Risk attributes related to background conditions

Risk attribute (variable name)	Response categories	Score	Attribute measurement suggestions
Adjacent fuels (adjfuels) *Fuels are one of the three categories on the wildfire behavior triangle.* *This attribute looks at a proxy of fuel type and fuel load/density. It does not necessarily analyze factors related to fuel conditions that are critical to understanding future potential wildfire behavior including: true fuel type, fuel arrangement, fuel continuity (vertical and horizontal), fuel moistures, fuel loads, combustion characteristics, etc. As such, this attribute is subject to a significant amount of assessor interpretation and subjectivity.* *NOTE: this table will be customized to include descriptions of local vegetation.*			
Which of the following best describes the dominant vegetation **100' - 150' from the home**? *This may be outside the property boundary.*	Light - Grasses with isolated brush	0	Within a band starting at 100’ from the home (limits of defensible space) and extending out to 150’ from the home, in all directions, estimate what is the dominant and primary fuel description. By "dominant and primary" we mean the fuels that are likely to play the greatest role in fire behavior, were those fuels to become involved in a fire.
	Medium - Sparse brush and/or isolated trees (ex. Lodgepole/aspen mix, thinned lodgepole stands with canopy separation)	20	
	Dense - Dense brush and/or dense trees (ex. continuous closed canopy lodgepole pine)	40	
	Unknown - not observed	40	If you cannot observe the attribute at all, choose "Unknown - not observed."

Table 4. Risk attributes related to defensible space

Risk attribute (variable name)	Response categories	Score	Attribute measurement suggestions
Defensible space (dspace) *Primary experimental research from the International Crown Fire Modeling Experiment (1998) demonstrated that structures (stick built, T-1-111 siding, composite shingles) were able to survive (with light scorch) from the radiant heat of an active crown fire at a distance as little as 10 meters (32.8 ft), without direct flame contact, but did ignite when the structure was exposed to direct flames. At 30 meters (98.42 ft), the same structures survived without any scorch. Along with modeling, case studies and other research, this famous experiment laid the foundation for the classic zones of defensible space: Zone 1 (0-30 ft) / Zone 2 (30-100 ft) / Zone 3 (100 ft or more with slope factor). Additional understanding and research have led to a fuller understanding of ignition vulnerabilities for the home (primarily related to ember ignitions). The 5-ft zone should be devoid of all combustible materials (including bark mulch or combustible vegetation).*			
What is the closest distance from the home to overgrown, dense, or unmaintained vegetation?	More than 100'	0	Use best professional judgement to determine the distance between the home and any "overgrown, dense or unmaintained vegetation." It is important to consider whether the property's *particular* vegetation would more likely than not contribute to an active wildland fire and thusly expose the home in question to direct flames, radiant heat, and/or convective heat that could presumably result in ignition in most imagined scenarios. In other words, if you were recommending treatment/mitigation for defensible space, would you recommend that the vegetation in question be managed within 5ft, 30ft, or 100ft of the home?
	30' - 100'	50	
	5' - 29'	75	
	Less than 5'	100	
	Unknown - not observed	100	If you cannot observe the attribute at all, choose "Unknown - not observed."
Other combustibles (combustibles) *Other combustibles are extremely common. It is important for homeowners to be aware that these materials represent a risk, particularly during the fire season, and particularly related to ember ignition exposure.*			
What is the closest distance from the home to combustible items **other than vegetation** such as lumber, firewood, a propane tank, hay bales, or other materials that could easily ignite?	None, greater than 30' from structure	0	Are there any other combustible materials that a structure triage group would likely want to remove/clean up in the event of an approaching wildfire? If so, how close to the home are these items to the home? For example, lumber, construction materials, firewood, propane tanks, hay bales, leaves, wicker furniture, or decorative ornaments.
	10' – 30'	40	
	5' – 9'	40	
	Less than 5'	80	
	Unknown - not observed	80	If you cannot observe the attribute at all, choose "Unknown - not observed."

Table 5. Risk attributes related to home ignition potential

Risk attribute (variable name)	Response categories	Score	Attribute measurement suggestions
Roofing material (roof) *The roof pays a major role in the vulnerability of the home to fire, particularly airborne embers, which can burn through roofing.* *It is important to note that roofing material is only one factor in the roofing equation as it relates to wildland fire. During a more in-depth analysis (such as an on-site consultation with the homeowner), it will be important to consider the entire roofing assembly with regards to the potential for future ignition during a wildland fire. Certain asphalt shingle and even metal roofs remain vulnerable to ignition due to the assembly. Important related factors to the roof are eaves and gutters. Open eaves represent a higher risk than soffited eaves. All vents/openings should at minimum incorporate 1/8" metal screening. Gutters filled with debris can be tinder for fire.*			
What is the **most vulnerable** roofing material?	Tile, metal, or asphalt shingles	0	Tile, metal, or asphalt shingles are commonly associated with a Class A roofing assembly - though not in all cases. Tar or rubberized roofs are commonly found with adobe SW style homes with a flat roof. Certainly, there are some additional types of roofing materials that are used besides the ones listed, in which case the assessor should decide using best available information related to the roofing material and its potential ignitability. In other instances, multiple types of roofing materials are used, particularly in homes with complex roof lines, dormers, and extensions. In these cases, we recommend rating the entire roof as whatever is the most vulnerable section.
	Wood (shake shingles)	300	
	Unknown - not observed	300	If you cannot observe the attribute at all, choose "Unknown - not observed."

Table 5. Risk attributes related to home ignition potential

Risk attribute (variable name)	Response categories	Score	Attribute measurement suggestions
Building Exterior (siding) *After the roof, the exterior siding represents the second largest (in terms of square feet) surface that is exposed to potential ignition risks. However, mitigating the risk, even to wood siding, can be achieved through defensible space combined with a variety of other "ember mitigation" techniques.* *This is probably the most challenging domain to assess during the RA, for many reasons including 1) there are dozens of commonly used siding materials, many of which claim to be resistant to fire, resistant to ignition, or noncombustible; 2) it is very common for a home to incorporate multiple different types of exterior cladding/siding; 3) some of the newer available products that fall in the general category of "fiber cement siding" have been designed to mimic wood; and 4) not all stucco applications meet fire resistant standards.* *It is up to the assessor to decide if any exterior cladding/siding represents a potential risk for home ignition.*			
What is the **most vulnerable** exterior siding material?	Non-combustible (tile, metal, brick, asphalt)	0	This category includes brick, stone, block, concrete synthetic stone, metal, stucco (3 stage or EIFS), fiber cement (ex. Hardie Board) or other materials that are considered Class A or B.
	Log or heavy timbers	35	To qualify as log, it needs to be considered "heavy log construction" with a minimum log diameter of 6 inches with all bark striped and incorporating a chinking material to fill the gaps between the logs.
	Maintained wood	35	Wood siding that has been recently treated with paint or stain. No signs of weathering detected.
	Weathered wood or vinyl	70	Wood or vinyl siding only. Faux logs, D-Link, and square logs qualify for this category.
	Unknown - not observed	70	If you cannot observe the attribute at all, choose "Unknown - not observed."

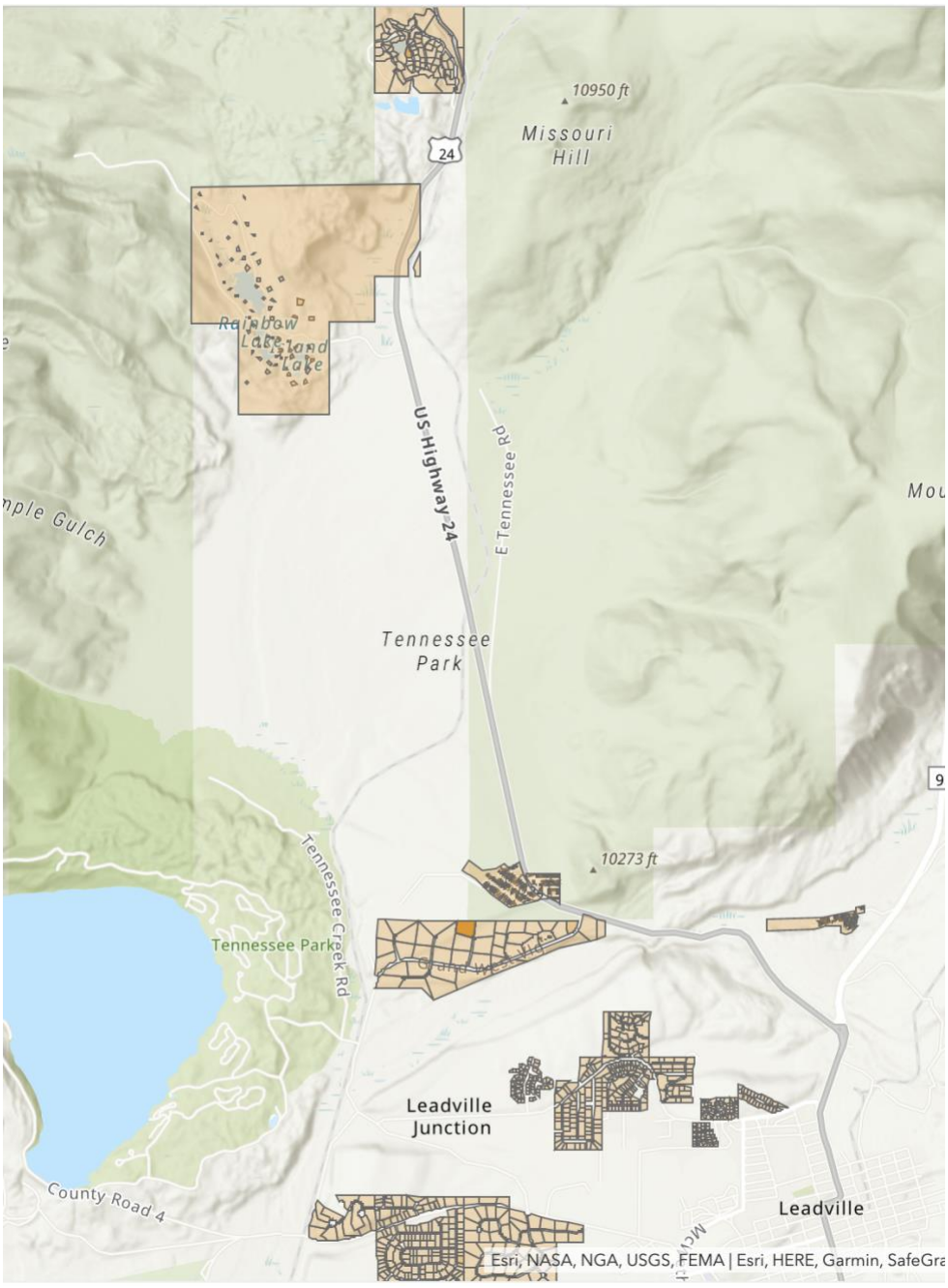
Table 5. Risk attributes related to home ignition potential

Risk attribute (variable name)	Response categories	Score	Attribute measurement suggestions
Combustible attachments (attach) *Decks, fences, and other attachments are well known to be considerable sources of home ignition vulnerability.* *Attached decks, fence, and other attachments s are a complicated subject. There are many, many types of decks construction styles and materials on the market. Recent research has indicated some novel approaches to mitigation for decks, including covering the tops of joists with a metal wrap.*			
Does the home have a combustible balcony, deck, porch, or fence attached to the structure?	None/concrete	0	If there is not anything attached to the structure, then the answer is no combustible attachments. If a deck, fence, or other attachment is present, the assessor will need to determine to what extent the attachment poses an ignition risk based upon an observation of the combustibility of such attachment. Composite decking boards (ex. Trex) are considered by many to be a better alternative than standard decking boards, and risk assessment categorizes composite decking as "composite attachment."
	Composite attachment	100	
	Wood attachment	100	
	Unknown - not observed	100	If you cannot observe the attribute at all, choose "Unknown - not observed."
Proximity to adjacent/neighboring homes (closehome) *Home to home ignitions (i.e., conflagration) are a significant factor in the spread of fire through more densely built environments. Homes and structures are generally built with combustible materials and contain gutters, porches, and vulnerable locations where embers can get trapped and combust, and then pass the fire to neighboring properties.*			
What is the closest distance to a neighboring home?	More than 100'	0	When assessing the home, determine the relative proximity of the nearest home.
	30' - 100'	50	
	10' - 29'	100	
	Less than 10'	200	
	Unknown - not observed	200	If you cannot observe the attribute at all, choose "Unknown - not observed."

2 Data Collection Tool Instructions

Before starting the WiRē rapid wildfire risk assessments (RAs), it's important to remember the strong tie between the RA and the homeowner survey. The driving principle behind the paired data collection approach is to empower residents to take action to reduce their wildfire risk.

Be consistent with the response categories throughout data collection. The goal of the WiRē RAs is to assess all parcels with residential structures in the study area, which comprise approximately 1097 parcels in the greater Leadville area. These parcels are indicated on the map below in orange.



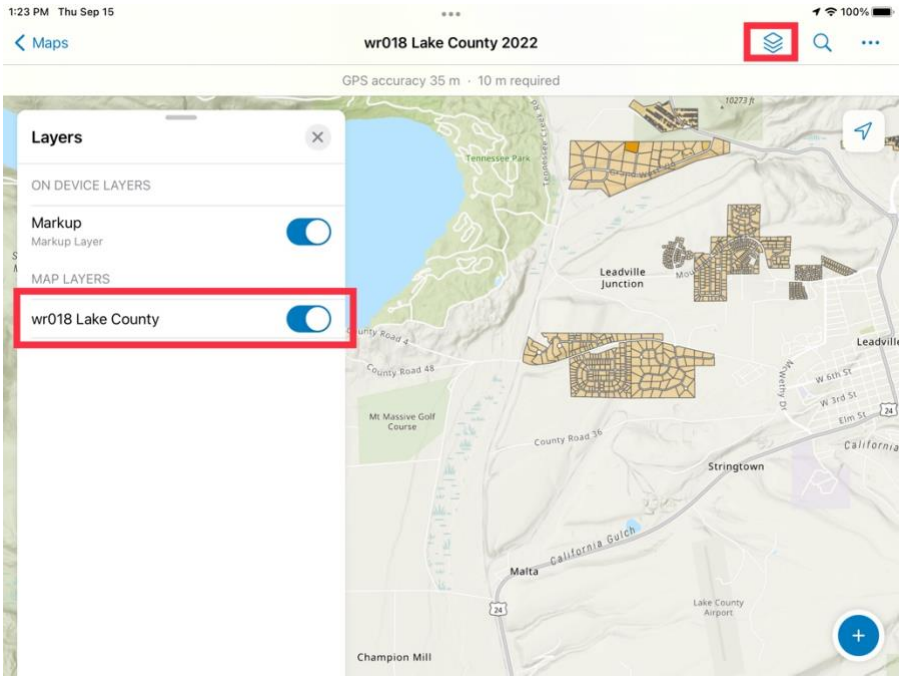
1. How to access the data collection app?

a. Download ArcGIS[1] Field Maps onto your tablet or other device.

[1] Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

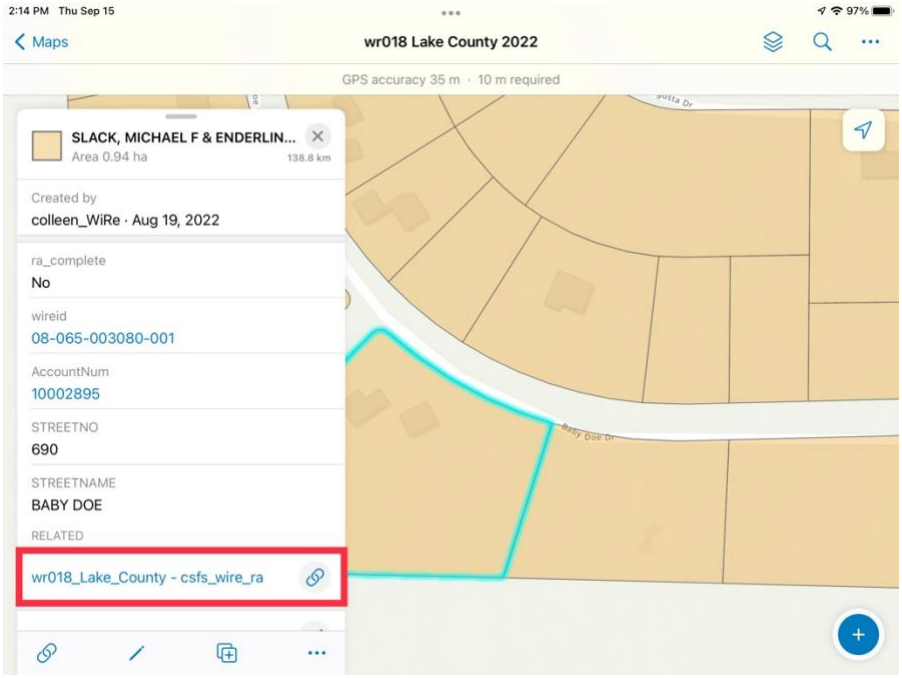
b. Log into the app using the following credentials:
    i. Username: WiRē_GIS3
    ii. Password: [redacted]

c. There will be map called wr018 Lake County 2022 on your display once you've logged into FieldMaps.
    i. Click on the map
    ii. Click the layers button and click on the words wr018 Lake County to bring you to the study area on the map.

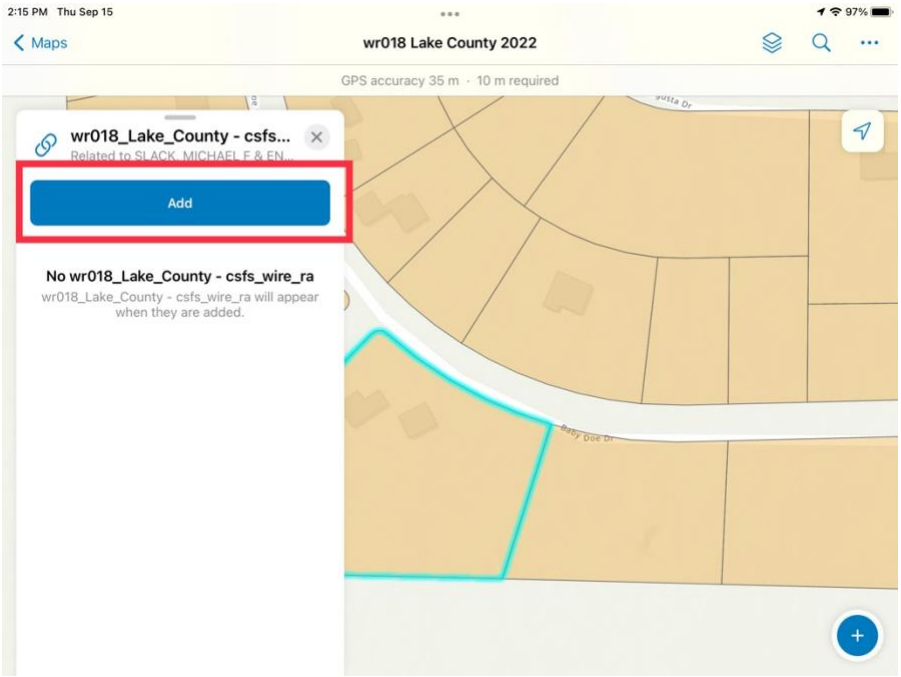


2. What to do to collect data?

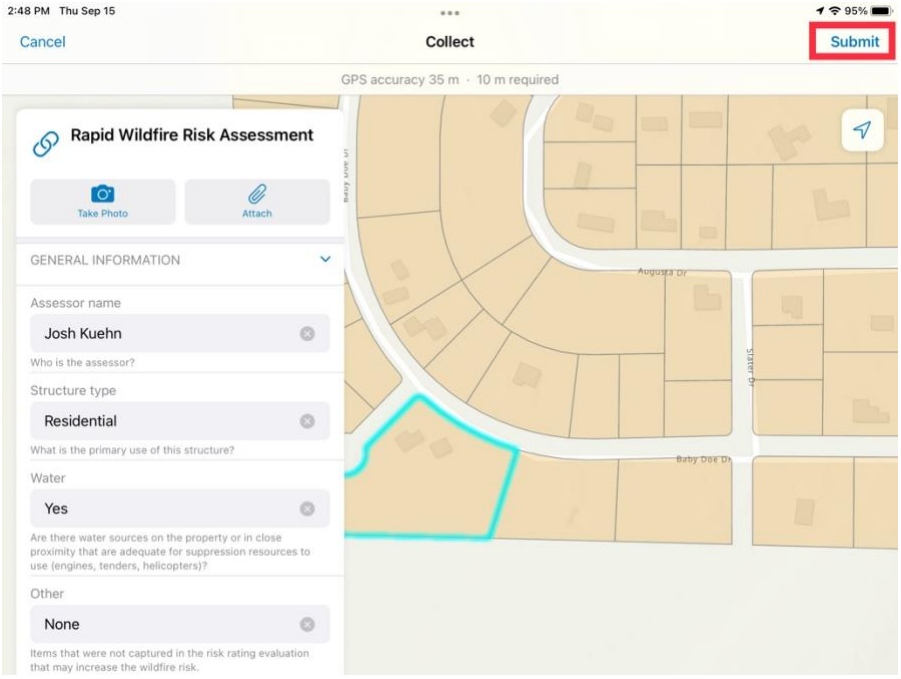
a. Open ArcGIS Field Maps and pan to the parcel
b. Zoom to an orange parcel and select it.
c. Click the link button.



d. Click on the blue add button

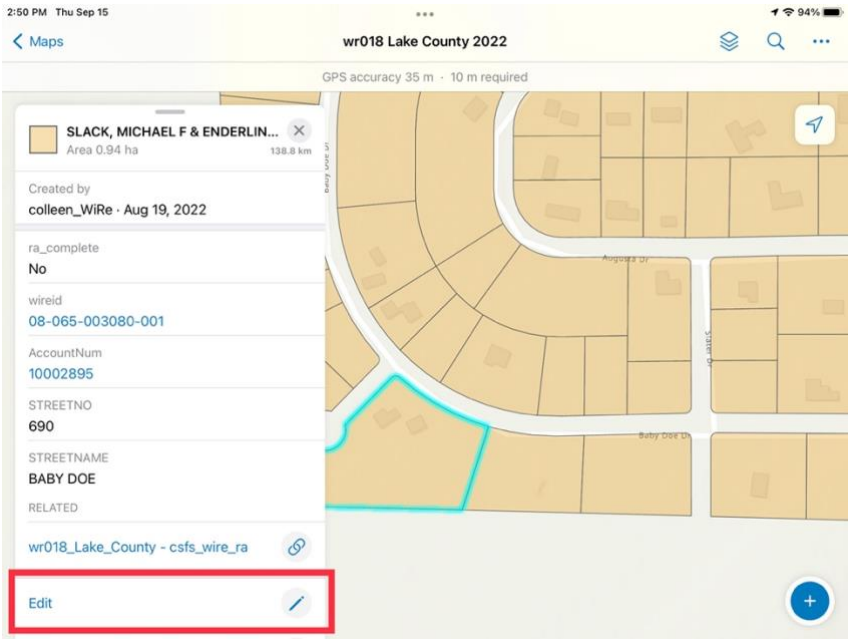


e. Fill out the form following protocols outlined in Section 1 of this Assessor Reference Guide. Be sure to answer all questions. When done, you must click Submit in the top lefthand corner.

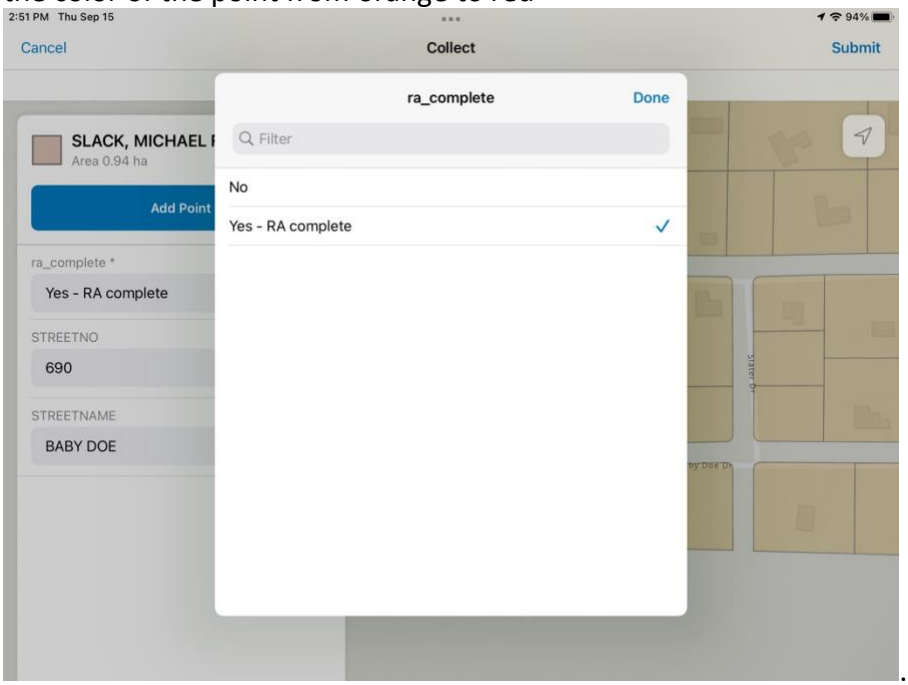


3. How to change the symbology to know where you have collected data?

a. As soon as you have clicked submit in step 2e, click the x to the right of "csfs_wire_ra:" and then click the x on the next screen.
b. Select the edit button on the parcel layer (you will see an orange parcel in the top left of the call out box).



c. Change the response to ra_complete to "Yes – RA complete." This will change the color of the point from orange to red



.

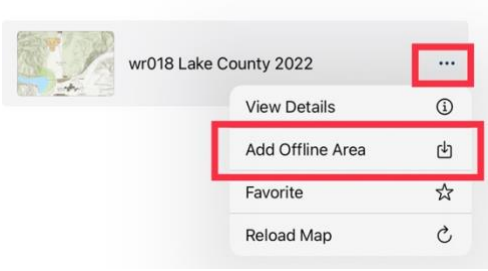
d. Then click submit in top, right-hand corner. Note: Do not click the "Add Point" button at the top left corner of the screen. If you do, click cancel in the top left and start again.

4. What to do when there are multiple residential structures on a parcel?

a. Some parcels might have multiple structures on them. Please complete an RA for **all** residential structures on a property.
b. To assess another residential structure on a parcel, do the following steps:
    i. Select the same parcel in FieldMaps and follow the same procedures in bullet #2. Add in a description in the comments field to indicate it is a new residential structure such as '2nd house on property possibly a rental' or '3rd residence on parcel appears used.'

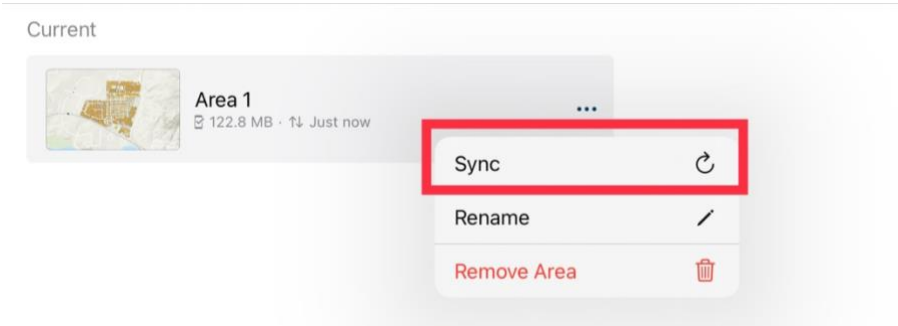
5. How to add an off-line map?

a. There are times in the field where you may not have internet connection. When you are in a place with internet, you can download an offline area to enable you to collect data without internet connection. To do this, follow these steps:
    i. From the main screen in ArcGIS Field Maps, select the three dots next to the wr018 Lake County 2022 and select "Add Offline Area"
    ii. Move the box over the area where you will conduct the rapid assessments and select "Download Area". It may take some time to fully download. Once the area is downloaded, you can go collect the data.

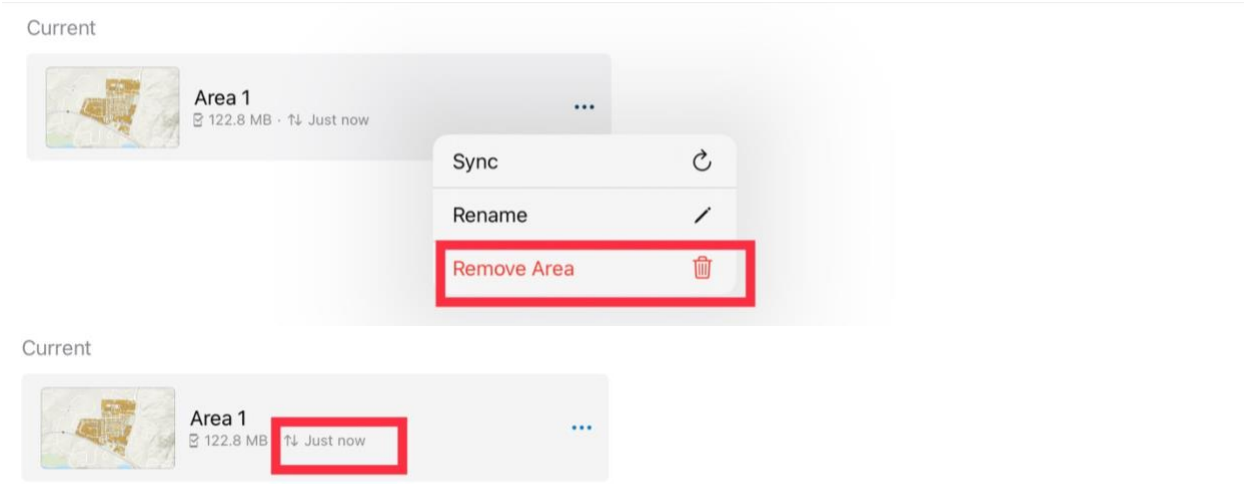


6. How to sync after being off-line?

a. When you have finished for the day, return to a place where you have WIFI to sync your work.
b. Go the map screen, select the three dots next to the offline area you selected in step #4, and then select "Sync."



a. You will know it has synced because the time will update. Right after you sync, it should say "Just Now".



b. Once you've synced the data, click on the three dots again and select "Remove Area." This will return you to the full view of the area.

7. What to do with multi-unit attached structure (ex., single family attached homes, condos, apartment buildings) embedded in one white polygon?

a. If a property has a structure with multiple units, conduct one rapid assessment for the entire structure and add a note in the comments field to let us know it was a multi-unit structure.
b. When you have submitted the rapid assessment and selected "Yes – RA complete" then the parcel will turn red, not all the parcels in the unit.

3 Rapid Assessment Scoring

	Risk attribute	Response categories	Attribute weight	Category score
Access	Address posting	Fully meets standard	1%	0
		Address sign is visible, but **does not meet all** standards		5
		Not posted/visible from the primary road		10
	Ingress/Egress	Two or more roads in/out	1%	0
		One road in/out		10
	Driveway clearance	Meets all driveway standards (height and width)	1%	0
		Meets one, but not both, standards (height or width)		5
		Does not meet either standard (height and width)		10
	Driveway length	Less than 150' long	1%	0
		150' or more **with** "adequate" turnaround		5
		150' or more **without** "adequate" turnaround		10
Background conditions	Distance to dangerous topography	More than 150'	5%	0
		50' - 150'		25
		Less than 50'		50
	Slope	Gentle - Less than 20%	2%	0
		Moderate - Between 20% and 45%		10
		Steep - Greater than 45%		20
	Adjacent fuels	Light - Grasses with isolated brush	4%	10
		Medium - Sparse brush and/or isolated trees (ex. Lodgepole/aspen mix, thinned lodgepole stands with canopy separation)		20
		Dense - Dense brush and/or dense trees (ex. continuous closed canopy lodgepole pine)		40

	Risk attribute	Response categories	Attribute weight	Category score
Defensible space	Defensible Space	More than 100'	10%	0
		30' - 100'		50
		5' - 29'		75
		Less than 5'		100
	Other combustibles	None, greater than 30' from structure	8%	0
		10' – 30'		40
		5' – 9'		80
		Less than 5'		80
Home ignition potential	Roofing materials	Tile, metal, or asphalt shingles	30%	0
		Wood (shake shingles)		300
	Building exterior	Non-combustible (tile, metal, brick, asphalt)	7%	0
		Log or heavy timbers		35
		Maintained wood		35
		Weathered wood or vinyl		70
	Combustible attachments	None/concrete	10%	0
		Composite attachment		100
		Wood attachment		100
	Proximity to adjacent homes	More than 100'	20%	0
		30' - 100'		50
		10' - 29' away		100
		Less than 10'		200

Overall Risk Rating		
Category	Lower bound	Upper bound
Low	20	240
Moderate	241	305
High	306	435
Very high	436	505
Extreme	506	1000

Appendix C: Wildfire Research (WiRē) Rapid Wildfire Risk Assessment Summary

Begins on next page.

The Wildfire Research Center

WiRē

Lake County Rapid Assessment Summary

On behalf of Leadville/Lake County Fire Rescue, Colorado State Forest Service (CSFS) staff conducted parcel-level rapid wildfire risk assessments in 2022/2023. Risk assessment data collection was collected as a census of all residential properties with a structure in the study area[1]. The rapid wildfire risk assessments were conducted for 783 residential properties using the standard WiRē Rapid Wildfire Risk Assessment (RA), which is comprised of a set of 13 attributes that includes building materials, vegetation near the home, background fuels and topography, and access to the property. Each attribute of the RA is evaluated relative to other private land parcels within the study area. As a result, the RA serves as an indicator of the relative risk of private land parcels within the study area, rather than an absolute measure of risk.

The 13 attributes are weighted and summed to produce an overall risk score for each parcel. The weights reflect the attributes' relative contribution (ranging from 1% - 30% per attribute) to overall wildfire risk. Following our process for a standard RA, we apply a standard approach for placing the overall risk scores into five risk categories: low (20-250), moderate (251-325), high (326-455), very high (456-540), extreme (541-1000). This process can be iterative over time but has been validated across previous WiRē projects.

To ensure consistent, high quality data collection CSFS conducted a training for those who would conduct the rapid risk assessments. WiRē produced a standardized reference sheet for data collectors for use in the field.

All parcel level assessments were conducted on the property being assessed unless access was blocked by a gated driveway or posted with no trespassing signage.

In instances when CSFS staff could not observe a risk attribute, the specialist selected "unknown/not observed." It is WiRē's protocol to assign the "unknown/not observed" and true missing data (i.e., the mitigation specialist did not select a response) the highest risk score for the attribute in question. This is consistent with other parcel risk and structure protection assessments. If a particular attribute is "unknown/not observed" or missing, practitioners and firefighters assume that a hazard exists. At best, the correct attribute response is chosen; at worst, the assessment invites a conversation with the parcel owner to delve deeper into the mitigation needs of the parcel in question and an update to their parcel risk assessment.

[1] Lake County Assessor data from June 2022 was used as the underlying dataset to collect data.

This project was funded by USDA Forest Service, Washington Office Fire and Aviation Management, and the Bureau of Land Management. The household survey administration was paid by grant funding from the University of Colorado Boulder.

** All data received and processed as of 10/10/23*

**Document prepared 10/10/23*

This protocol allows us to report results for all residential parcels in the study area rather than only those for which all attributes could be observed. For each risk attribute in the tables below, we report the number of "unknown/not observed" and missing as a footnote.

The following tables present a summary of the CSFS staff's responses to the 13 risk attributes in the RA. Additionally, the tables present the results of the overall wildfire risk rating, which is the sum of the attribute scores. The percentages might not add to 100% due to rounding. In all tables below, RA refers to rapid assessment.

1.1 Overall risk rating

Overall risk rating: RA: Based on the sum of the 13 attribute scores.				
Response categories	**Score range**	**Number (N=783)**	**% of all RAs in study area**	
Low	20-250	8	1%	
Moderate	251-325	71	9%	
High	326-455	365	47%	
Very high	456-540	223	28%	
Extreme	541-1000	116	15%	

1.2 Home ignition potential

Risk attribute: Roof (30% of total RA score) What is the most vulnerable roofing material?				
Response categories	**Score**	**Number (N=783)**	**% of all RAs in study area**	
Tile, metal, or asphalt shingles	0	766	98%	
Wood (shake shingles)	300	17	2%	
*Out of all RAs in the study area, 13 were missing/unobserved (2%) and included in the highest risk category.				

Risk attribute: Siding (7% of total RA score) What is the most vulnerable exterior siding material?				
Response categories	**Score**	**Number (N=783)**	**% of all RAs in study area**	
Stucco, cement, brick, stone, or other noncombustible siding	0	70	9%	
Log or heavy timbers	35	370	47%	
Wood or vinyl siding	70	343	44%	
* Out of all RAs in study area, 0 were missing/unobserved.				

Risk attribute: Combustible attachments (10% of total RA score) Does the home a combustible balcony, deck, or fence attached to the structure?				
Response categories	**Score**	**Number (N=783)**	**% of all RAs in study area**	
No combustible attachments	0	7	1%	
Combustible attachments present	100	776	99%	
* Out of all RAs in study area, 0 were missing/unobserved.				

Risk attribute: Distance to adjacent homes (20% of total RA score) What is the closest distance to a neighboring home?				
Response categories	**Score**	**Number (N=783)**	**% of all RAs in study area**	
More than 100'	0	150	19%	
30' - 100'	50	209	27%	
10' - 29' away	100	227	29%	
Less than 10'	200	197	25%	
*Out of all RAs in the study area, 9 were missing/unobserved (1%) and included in the highest risk category.				

1.3 Defensible space

Risk attribute: Distance to overgrown vegetation (0 – 100 ft) (10% of total RA score)
What is the closest distance from the home to overgrown, dense, or unmaintained vegetation?

Response categories	Score	Number (N=783)	% of all RAs in study area
More than 100'	0	0	0%
30' - 100'	50	26	3%
5' - 29'	75	271	35%
Less than 5'	100	486	62%

* Out of all RAs in study area, 87 were missing/unobserved (11%) and included in the highest risk category.

Risk attribute: Distance to other combustibles (non-vegetation) (8% of total RA score)
What is the closest distance from the home to combustible items other than vegetation such as lumber, firewood, a propane tank, hay bales, or other materials that could easily ignite?

Response categories	Score	Number (N=783)	% of all RAs in study area
More than 30' or no combustible items	0	55	7%
5' - 30'	40	108	14%
Less than 5'	80	620	79%

*Out of all RAs in the study area, 1 was missing/unobserved (<1%) and included in the highest risk category.

1.4 Background conditions

Risk attribute: Distance to dangerous topography (5% of total RA score)
What is the closest distance from the home to a ridge, steep drainage, or narrow canyon?

Response categories	Score	Number (N=783)	% of all RAs in study area
More than 150'	0	777	99%
50' - 150'	25	3	0%
Less than 50'	50	3	0%

* Out of all RAs in study area, 2 were missing/unobserved (<1%) and included in the highest risk category.

Risk attribute: Slope (2% of total RA score)
The slope of a property refers to the steepness of the land. A large property may have steep, moderate, and gentle slopes. How would you describe the slope of the property within 150' of the home?

Response categories	Score	Number (N=783)	% of all RAs in study area
Gentle - Less than 20%	0	749	96%
Moderate - Between 20% and 45%	10	32	4%
Steep - Greater than 45%	20	2	0%

* Out of all RAs in study area, 2 were missing/unobserved (<1%) and included in the highest risk category.

Risk attribute: Adjacent fuels (100 - 150 ft) (4% of total RA score)
Which of the following best describes the dominant vegetation 100' to 150' from the home? This may be outside the property boundary.

Response categories	Score	Number (N=783)	% of all RAs in study area
Light	10	152	19%
Medium	20	87	11%
Dense	40	544	69%

* Out of all RAs in study area, 4 were missing/unobserved (1%) and included in the highest risk category.

1.5 Access

Risk attribute: Address posting (1% of total RA score)
Does the address sign meet all local standards (Posted, blue reflective, visible from the road)

Response categories	Score	Number (N=783)	% of all RAs in study area
Fully meets standard	0	5	1%
Address sign is visible, but **does not meet all** standards	5	473	60%
Not posted/visible from the primary road	10	305	39%

*Out of all RAs in the study area, 3 were missing/unobserved (<1%) and included in the highest risk category.

Risk attribute: Ingress/egress (1% of total RA score)
If the road to access the home was blocked due to a wildfire, is there another road to get out of the community?

Response categories	Score	Number (N=783)	% of all RAs in study area
Two or more roads in/out	0	624	80%
One road in/out	10	159	20%

*Out of all RAs in the study area, 0 were missing/unobserved.

Risk attribute: Driveway clearance (1% of total RA score)
Does the driveway meet the horizontal and vertical clearance standards: height at least 20' and width at least 12'?

Response categories	Score	Number (N=783)	% of all RAs in study area
Meets all driveway standards. Meets both height (at least 13.5') and width clearance (at least 20')	0	638	81%
Meets one, but not both, standards (height or width)	5	98	13%
Does not meet either standard (height and width)	10	47	6%

*Out of all RAs in the study area, 18 were missing/unobserved (2%) and included in the highest risk category.

Risk attribute: Driveway length (1% of total RA score) What best describes the driveway?				
Response categories	**Score**	**Number (N=783)**	**% of all RAs in study area**	
Less than 150' long	0	540	69%	
150' or more **with** "adequate" turnaround	5	152	19%	
150' or more **without** "adequate" turnaround	10	91	12%	
* Out of all RAs in study area, 18 were missing/unobserved (2%) and included in the highest risk category.				

Appendix D: Comparison of Wildfire Research (WiRē) Rapid Wildfire Risk Assessment and Household Survey

Begins on next page.

Lake County CSFS Rapid Assessment Compared to Household Survey Responses

On behalf of Leadville/Lake County Fire Rescue, Colorado State Forest Service (CSFS) staff conducted parcel-level rapid wildfire risk assessments in 2022/2023 and administered a household survey in 2023. The rapid assessment provides the professional's risk rating for each parcel, and the household survey provides, among other things, respondent's self-assessed risk for their own parcel. Pairing these data is the heart of the WiRē Approach because it allows us to analyze the risk gap between how professionals rate wildfire risk and how survey respondents (i.e., homeowners) perceive their risk.

Overall, there are 158 properties for which we have a rapid assessment paired with household survey. There are an additional 625 properties with only a rapid assessment, for a total of 783 rapid assessments in the study area. Within this document, we present the following:

- Section 1 provides graphs that compare the professional risk ratings from the rapid assessment to the self-assessed risk ratings from the paired household survey.
- Section 2 provides tables that provide a three-way comparison of risk ratings from all rapid assessments in the study area, the subset of rapid assessments for which there is a paired household survey, and the household survey self-assessment.

Section 1 and Section 2 are organized by overall risk rating, followed by the attribute-level risk ratings. The attribute-level risk ratings are grouped into the following categories: home ignition potential, defensible space, background conditions, and access.

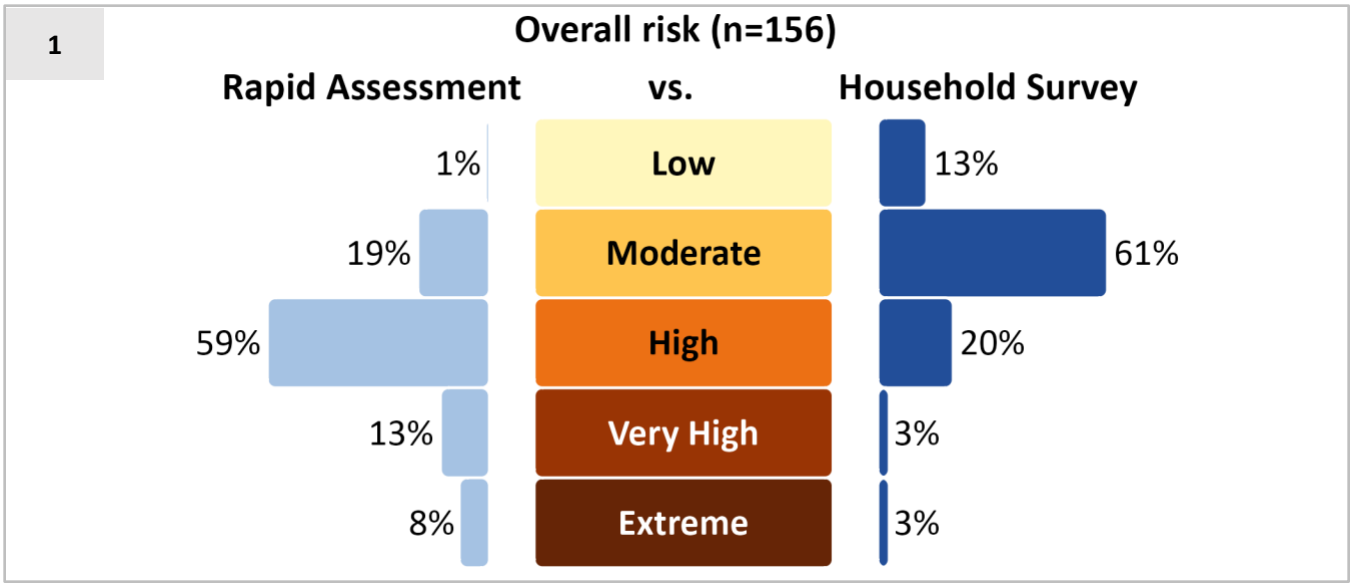
**This project was funded by USDA Forest Service, Washington Office Fire and Aviation Management, and the Bureau of Land Management. The household survey administration was paid by grant funding from the University of Colorado Boulder.*
**All data received and processed as of January 22, 2024*
**Document prepared February 13, 2024*

1. Comparison of paired WiRē Rapid Assessment vs. Household Survey

In this section, we compare professional risk ratings and household survey respondents' self-assessments for properties' overall risk rating and the 13 risk attributes included in the rapid assessment. These comparisons are presented as graphs. For the overall risk rating, the professional risk ratings are on the left and the household survey respondent' self-assessment is on the right. For the remaining risk attributes, the first bar shows the professional risk rating, and the second bar presents the household survey respondents' self-assessment. For each individual risk attribute, our comparisons only include the data from properties for which we have both rapid assessment and household survey data for that particular attribute, and thus the number of records (signified by "n=") varies by attribute and is reported for each.

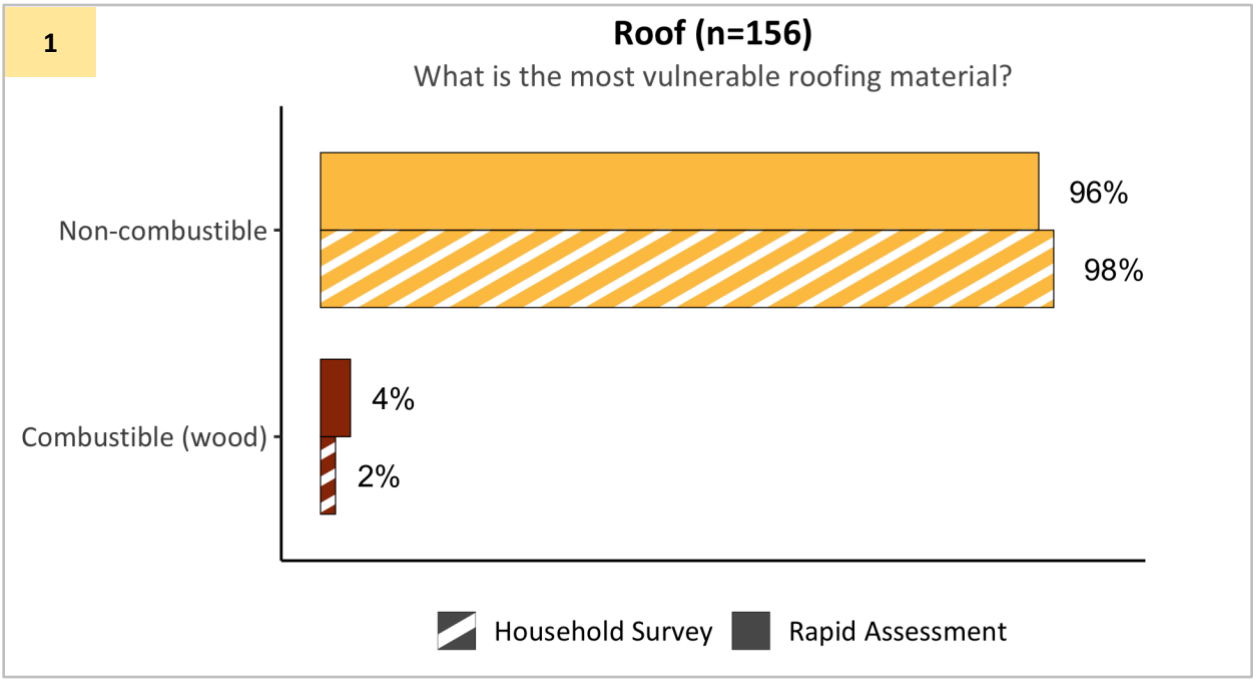
1.1 Overall risk rating

1

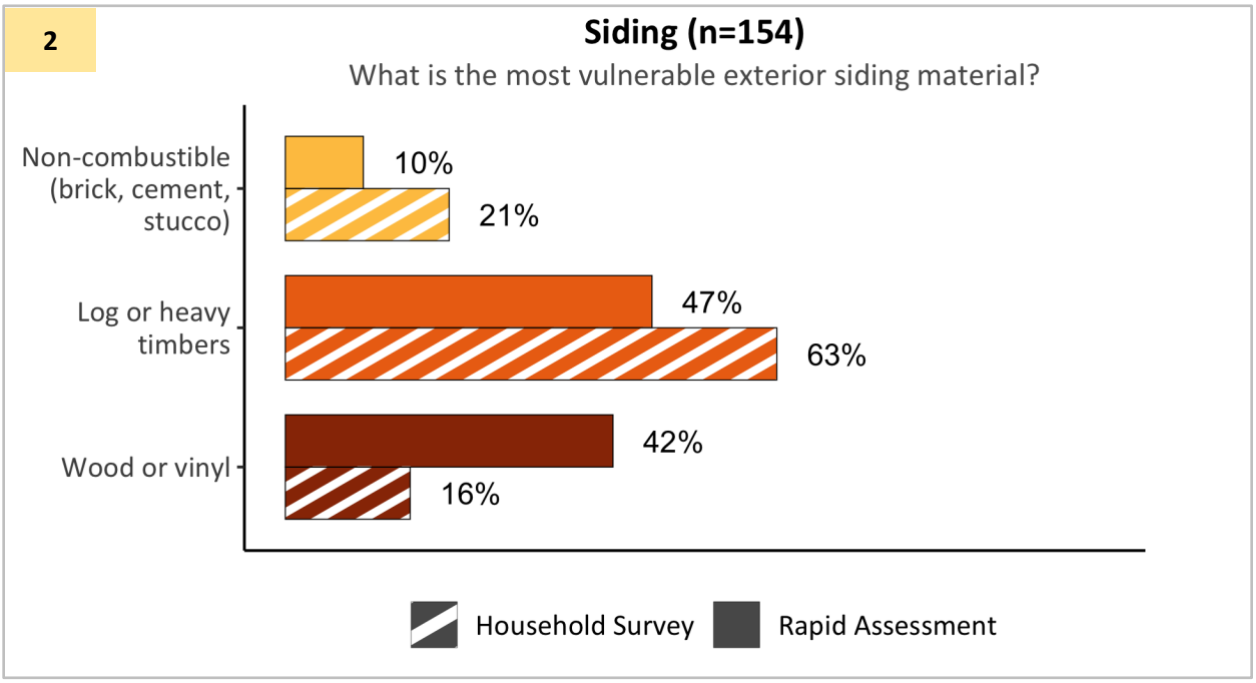


1.2 Home ignition potential

1



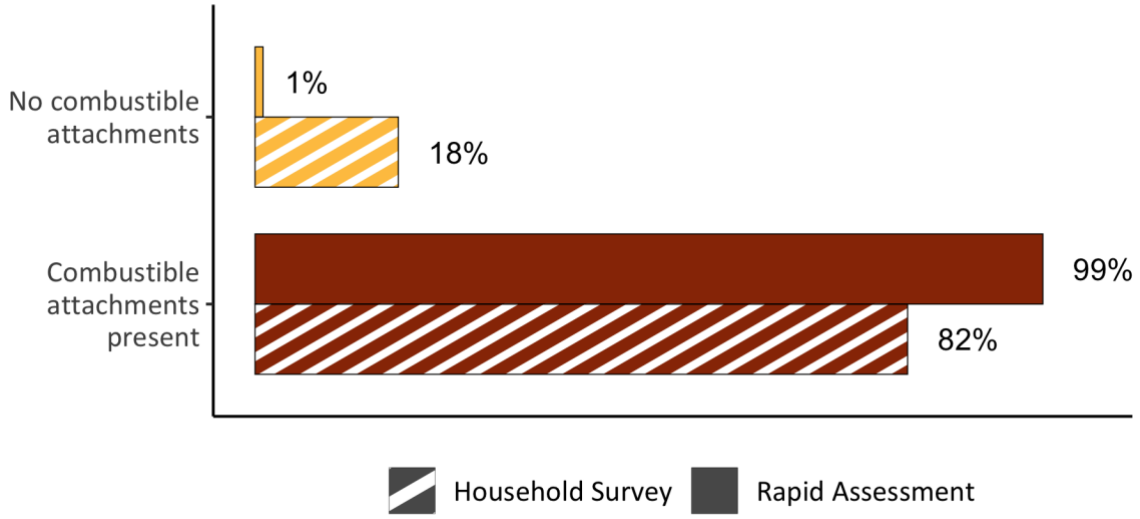
2



3

Combustible attachments (n=156)

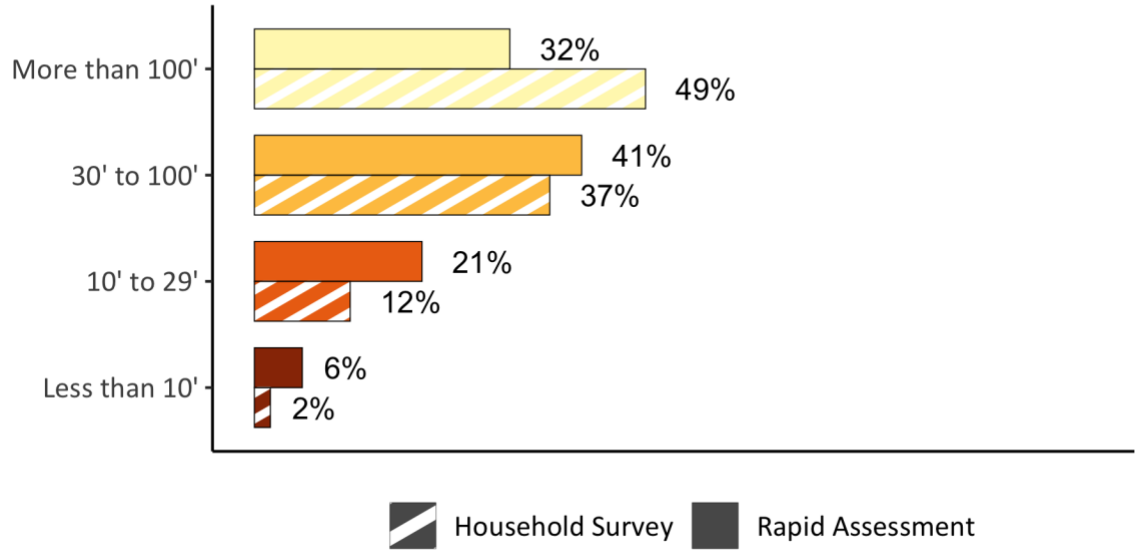
Does the home a combustible balcony, deck, or fence attached to the structure?



4

Distance to adjacent homes (n=155)

What is the closest distance to a neighboring home?

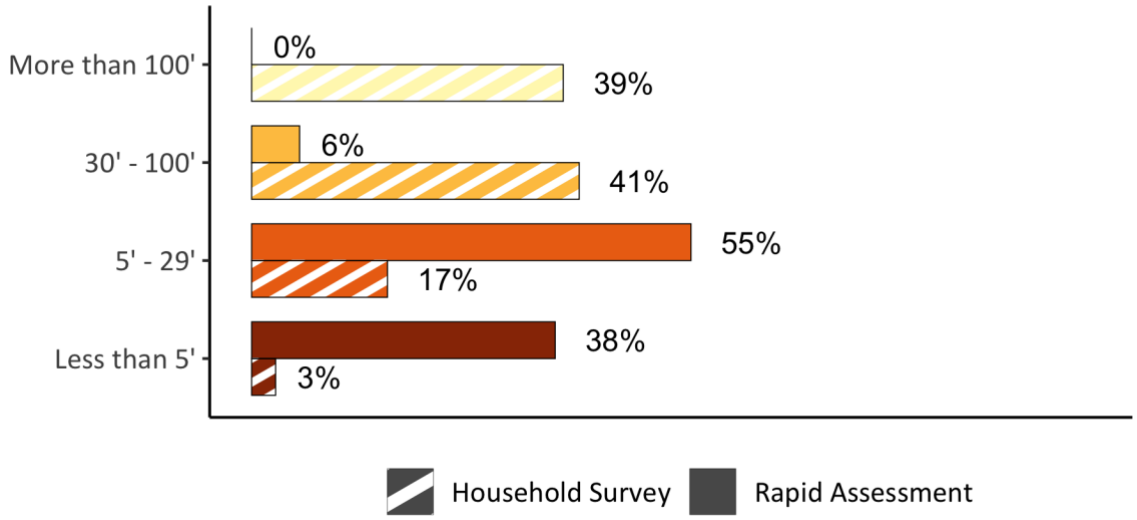


1.3 Defensible space

5

Distance to overgrown vegetation (0'-100') (n=155)

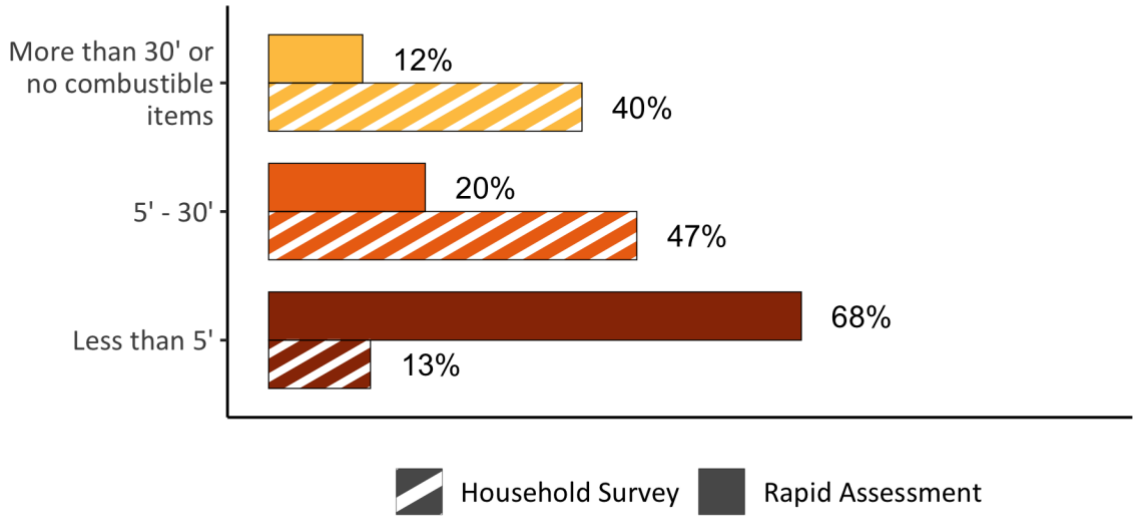
What is the closest distance from the home to overgrown, dense, or unmaintained vegetation?



6

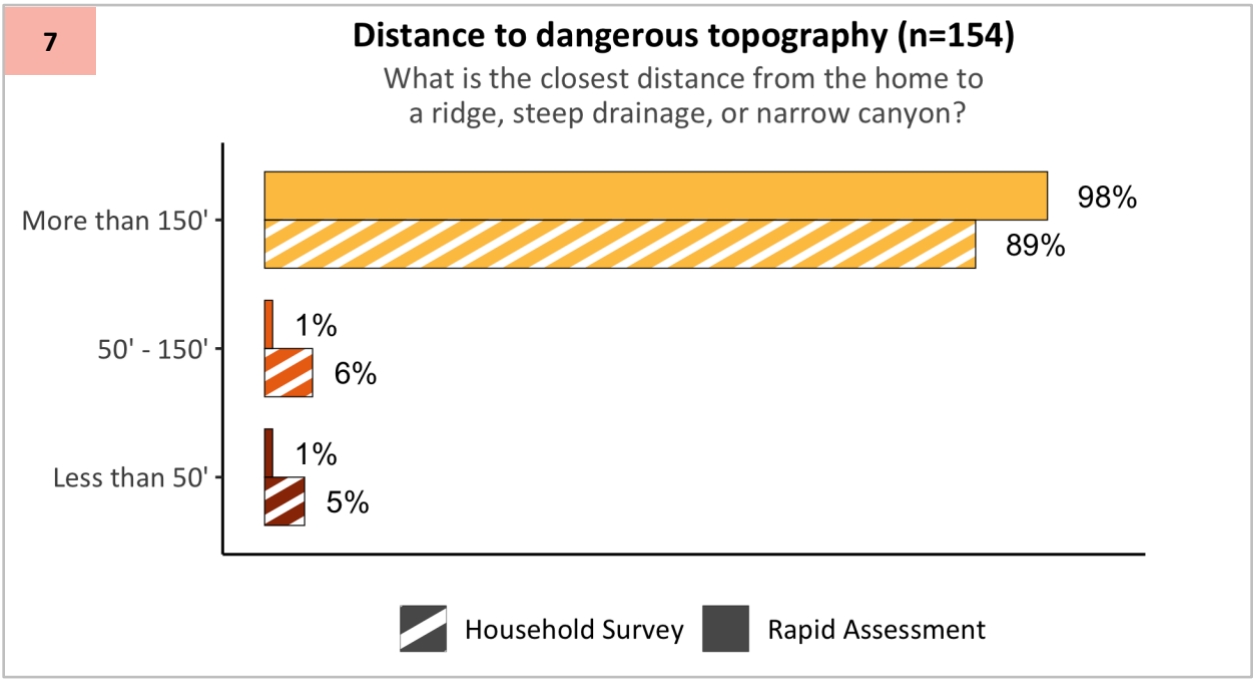
Distance to other combustibles (non-vegetation) (n=156)

What is the closest distance to combustible items other than vegetation?

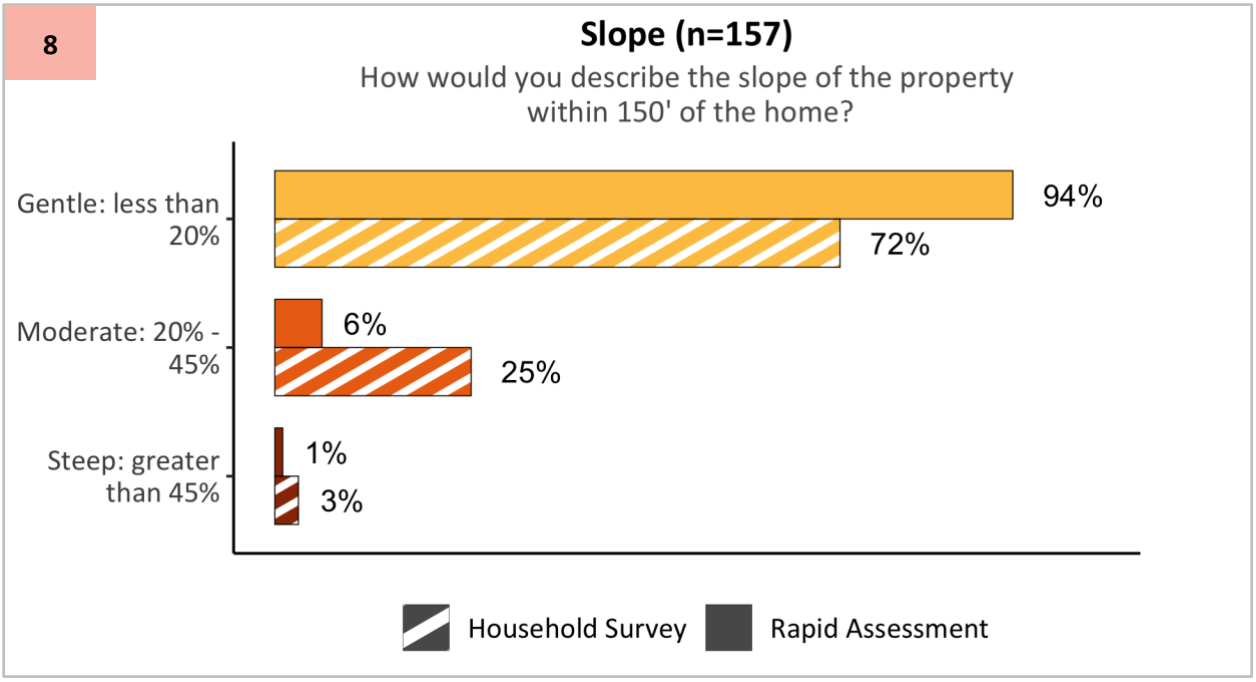


1.4 Background conditions

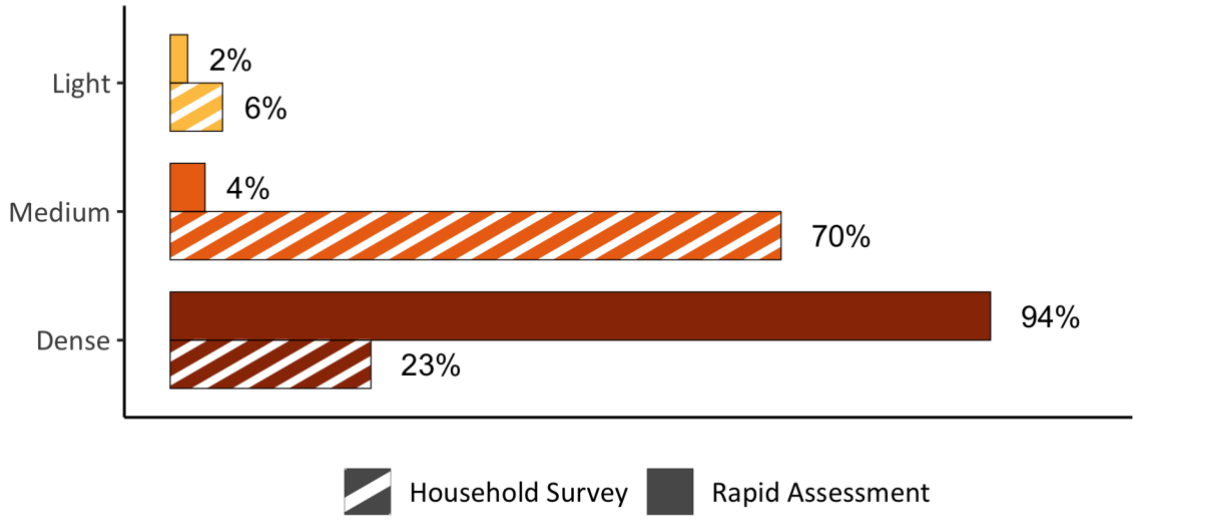
7



8



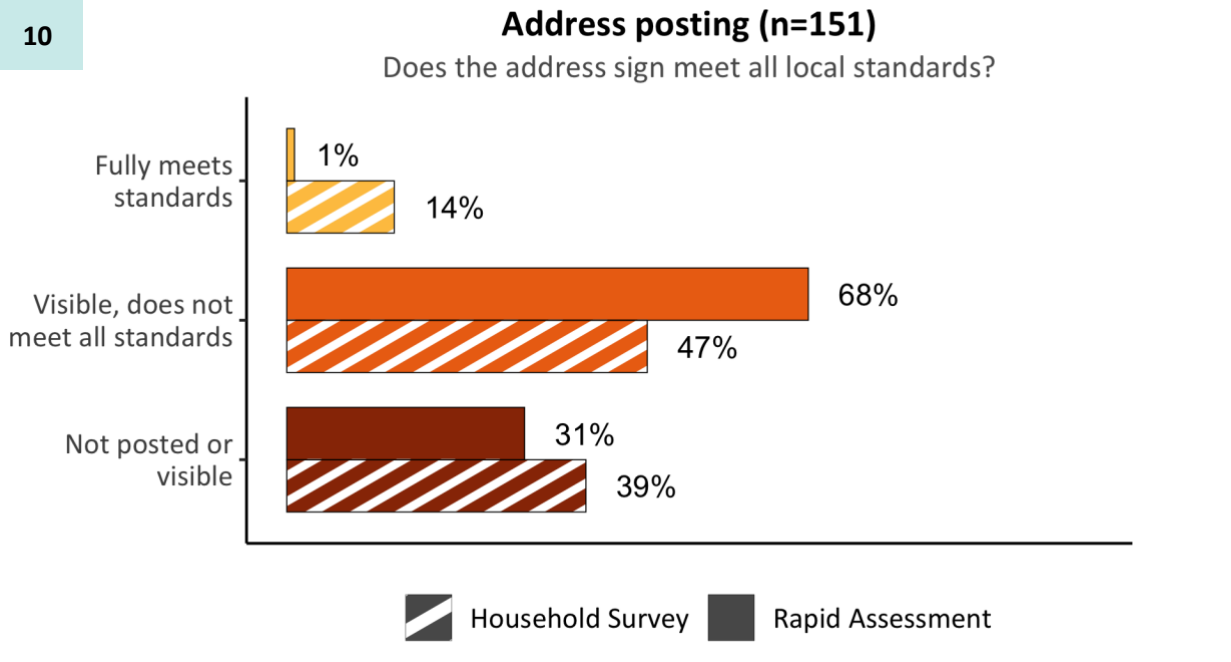
9



Additional description of categories: Light density ("grasses with isolated brush"), medium ("sparse brush and/or isolated trees (ex. Lodgepole/aspen mix, thinned lodgepole stands with canopy separation"), dense ("dense brush and/or dense trees (ex. continuous closed canopy lodgepole pine)").

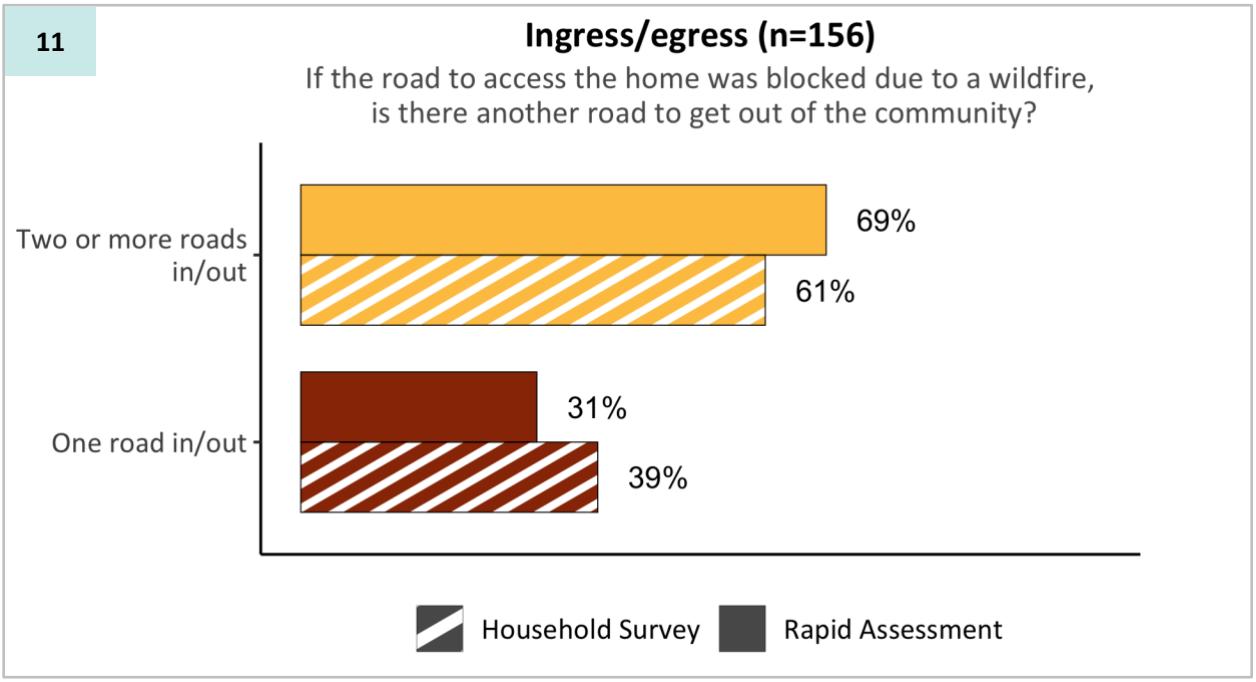
1.5 Access

10

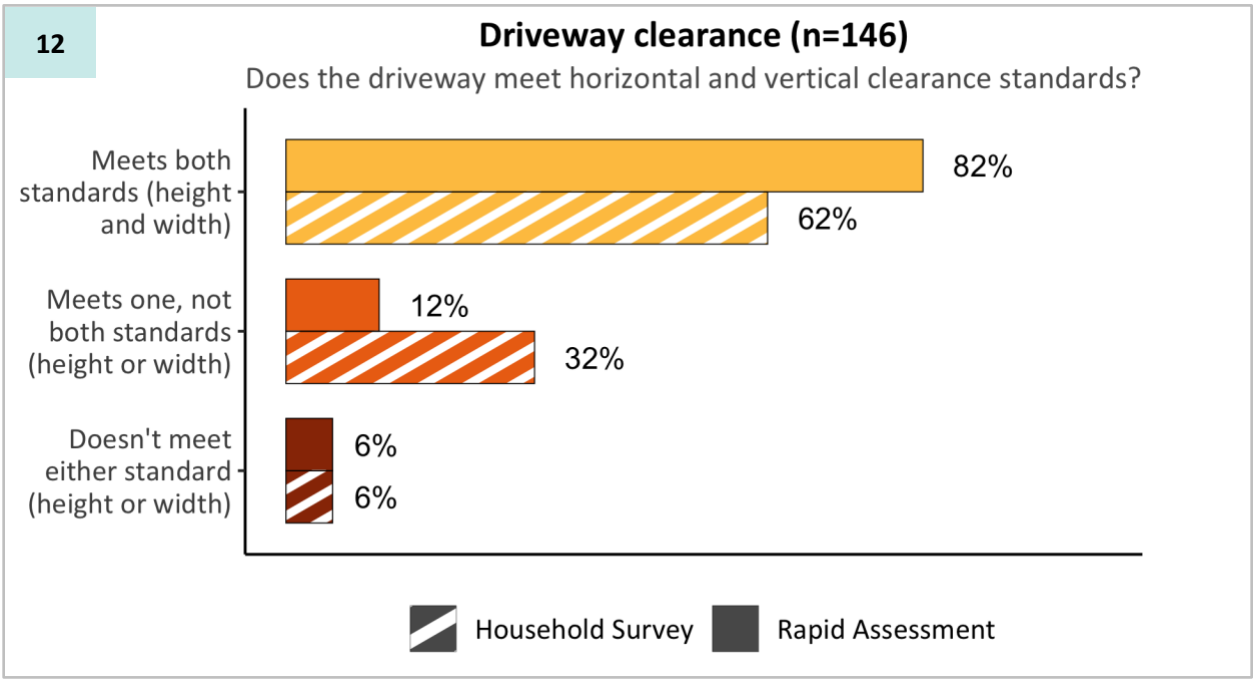


Standards: posted at end of driveway, reflective, 4-inch numerals, on a contrasting background (white letters on blue background) and made of noncombustible materials.

11

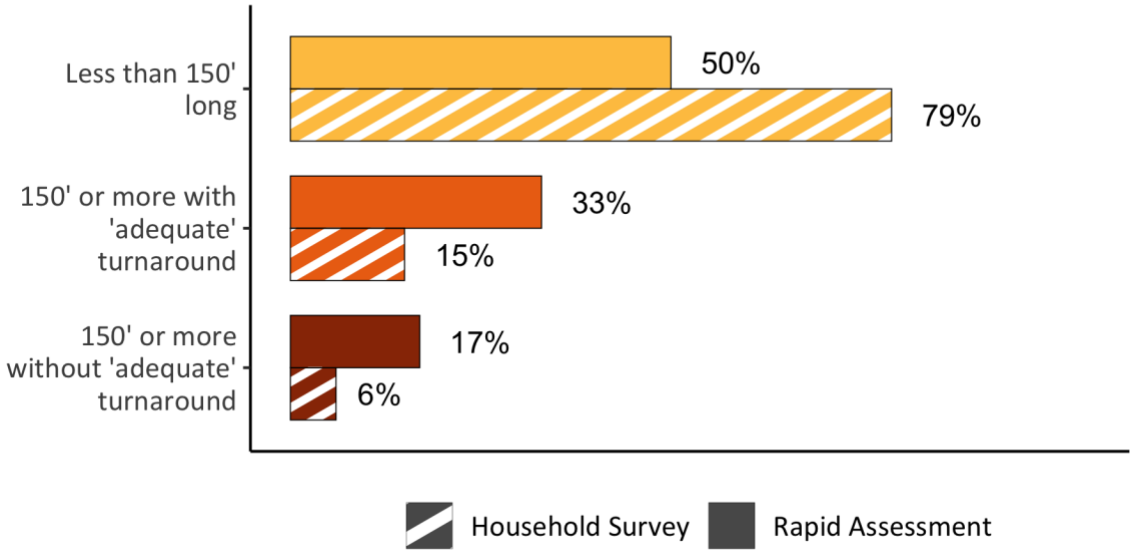


12



Standards: height at least 13.5' and width at least 20'.

13


Driveway length (n=149)
What best describes the driveway?
Less than 150' long
50%
79%
150' or more with 'adequate' turnaround
33%
15%
150' or more without 'adequate' turnaround
17%
6%
Household Survey
Rapid Assessment

2. Comparison of all Rapid Assessments vs. paired Rapid Assessment and Household Survey

Section 2 provides tables that provide a three-way comparison of risk ratings from all rapid assessments in the study area, the subset of rapid assessments for which there is a paired household survey, and the household survey self-assessment.

1.1 Overall risk rating

Overall risk rating: Based on the sum of the 13 attribute scores. Homeowner's self-assessment response to: What do you think is your property's current overall wildfire risk rating?			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=156)**	**Self-assessment from household surveys (n=156)**
Low	1%	1%	13%
Moderate	9%	19%	61%
High	47%	59%	20%
Very high	28%	13%	3%
Extreme	15%	8%	3%

1.2 Home ignition potential

Risk attribute: Roof What is the most vulnerable roofing material?			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=156)**	**Self-assessment from household surveys (n=156)**
Non-combustible (tile, metal, or asphalt shingles)	98%	96%	98%
Combustible (wood shake shingles)	2% [a]	4% [b]	2%

a. Out of all rapid assessments in the study area, 13 were missing/unobserved (2%) and included in the highest risk category.
b. Out of the subset of rapid assessments with a paired household survey, 4 were missing/unobserved (3%) and included in the highest risk category.

Risk attribute: Siding What is the most vulnerable exterior siding material?			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=154)**	**Self-assessment from household surveys (n=154)**
Stucco, cement, brick, stone, or other noncombustible siding	9%	10%	21%
Log or heavy timbers	47%	47%	63%
Wood or vinyl siding	44% [a]	42% [b]	16%
a. Out of all rapid assessments in the study area, 0 were missing/unobserved. b. Out of the subset of rapid assessments with a paired household survey, 0 were missing/unobserved.			

Risk attribute: Combustible Attachments Does the residence have a combustible balcony, deck, porch, or fence attached to the structure?			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=156)**	**Self-assessment from household surveys (n=156)**
No combustible attachments	1%	1%	18%
Combustible attachments present*	99% [a]	99% [b]	82%
a. Out of all rapid assessments in the study area, 0 were missing/unobserved. b. Out of the subset of rapid assessments with a paired household survey, 0 were missing/unobserved.			

Risk attribute: Distance to adjacent homes What is the closest distance to a neighboring home?			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=155)**	**Self-assessment from household surveys (n=155)**
More than 100’	19%	32%	49%
30’ – 100’	27%	41%	37%
10’ – 29’	29%	21%	12%
Less than 10’	25% [a]	6% [b]	2%
a. Out of all rapid assessments in the study area, 9 were missing/unobserved (1%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 2 were missing/unobserved (1%) and included in the highest risk category.			

1.3 Defensible space

Risk attribute: Distance to overgrown vegetation (0 – 100 ft) What is the closest distance from the residence to overgrown, dense, or unmaintained vegetation?			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=155)**	**Self-assessment from household surveys (n=155)**
More than 100'	0%	0%	39%
Between 30' - 100'	3%	6%	41%
Between 5' - 29'	35%	55%	17%
Less than 5'	62% [a]	38% [b]	3%
a. Out of all rapid assessments in the study area, 87 were missing/unobserved (11%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 19 were missing/unobserved (12%) and included in the highest risk category.			

Risk attribute: Distance to other combustibles (non-vegetation) What is the closest distance to combustible items other than vegetation such as lumber, firewood, a propane tank, hay bales, or other materials that could easily ignite?			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=156)**	**Self-assessment from household surveys (n=156)**
Greater than 30' from structure or no combustible items	7%	12%	40%
Between 5'-30' from structure	14%	20%	47%
Less than 5' from structure*	79% [a]	68% [b]	13%
a. Out of all rapid assessments in the study area, 1 was missing/unobserved (<1%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 0 were missing/unobserved.			

1.4 Background conditions

Risk attribute: Distance to dangerous topography What is the closest distance from the home to a ridge, steep drainage, or narrow canyon?			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=154)**	**Self-assessment from household surveys (n=154)**
More than 150'	99%	98%	89%
50' - 150'	<1%	1%	6%
Less than 50'	<1% [a]	1% [b]	5%
a. Out of all rapid assessments in the study area, 2 were missing/unobserved (<1%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 1 was missing/unobserved (<1%) and included in the highest risk category.			

Risk attribute: Slope The "slope" or "grade" of a property refers to the steepness of the land. A large property may have steep, moderate, and gentle slopes. How would you describe the overall slope within 150 feet of the home?			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=157)**	**Self-assessment from household surveys (n=157)**
Gentle (less than 20%)	96%	94%	72%
Moderate (between 20% and 45%)	4%	6%	25%
Steep (greater than 45%)	<1% [a]	1% [b]	3%
a. Out of all rapid assessments in the study area, 2 were missing/unobserved (<1%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 1 was missing/unobserved (<1%) and included in the highest risk category.			

Risk attribute: Adjacent Fuels (100 – 150 ft) Which of the following best describes the dominant vegetation 100'-150' from the home? This may be outside the property boundary.			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=155)**	**Self-assessment from household surveys (n=155)**
Light	19%	2%	6%
Moderate	11%	4%	70%
Dense	69% [a]	94% [b]	23%
a. Out of all rapid assessments in the study area, 4 were missing/unobserved (<1%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 0 were missing/unobserved.			

1.5 Access

Risk attribute: Address Posting Does the address sign meet all of the standards?			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=151)**	**Self-assessment from household surveys (n=151)**
Fully meets standard	1%	1%	14%
Address sign is visible, but **does not meet all** standards	60%	68%	47%
Not posted/visible from the primary road	39% [a]	31% [b]	39%
a. Out of all rapid assessments in the study area, 3 were missing/unobserved (<1%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 1 was missing/unobserved (<1%) and included in the highest risk category.			

Risk attribute: Ingress/Egress If the road to access the residence was blocked due to a wildfire, is there another road to get out of the community?			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=156)**	**Self-assessment from household surveys (n=156)**
Two or more roads in/out	80%	69%	61%
One road in/out	20% [a]	31% [b]	39%
a. Out of all rapid assessments in the study area, 0 were missing/unobserved. b. Out of the subset of rapid assessments with a paired household survey, 0 were missing/unobserved.			

Risk attribute: Driveway clearance Does the driveway meet the horizontal and vertical clearance standards?			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=146)**	**Self-assessment from household surveys (n=146)**
Meets **all** driveway standards	81%	82%	62%
Meets one, but not both, standards (height or width)	13%	12%	32%
Does not meet either standard (height or width)	6% [a]	6% [b]	6%
a. Out of all rapid assessments in the study area, 18 were missing/unobserved (2%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 4 were missing/unobserved (3%) and included in the highest risk category.			

Risk attribute: Driveway length What best describes the driveway?			
Response categories	**All rapid assessments in study area (N=783)**	**Subset of rapid assessments with a paired household survey (n=149)**	**Self-assessment from household surveys (n=149)**
150 feet long or less	69%	50%	79%
Longer than 150 feet with turnaround "adequate" turnaround	19%	33%	15%
Longer than 150 feet without "adequate" turnaround	12% [a]	17% [b]	6%
a. Out of all rapid assessments in the study area, 18 were missing/unobserved (2%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 6 were missing/unobserved (4%) and included in the highest risk category.			

Appendix E: Wildfire Research (WiRē) Household Survey Summary

Begins on next page.

Living with Wildfire in Lake County in 2023

Number of completed surveys: **160**
Number of surveys mailed: 683
n = number of observations
Response rate: 23.4%
Blue numbers are percent responses (might not total to 100% due to rounding)
Red words are variable names
Please note: We encourage use of this survey instrument for applied, research, and/or publication purposes but request to be notified before any such use at: info@wildfireresearchcenter.org

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**All data received and processed as of January 17, 2024*
**Document prepared January 18, 2024*

Section 1: In this first section of the survey, we ask about your home in Lake County. Please answer the following questions with respect to your ***Lake County home***.

When choosing a response, please fill in the circle completely. Correct: ● Incorrect: ⊘ ◉ ◔

ownrent_a (n=158)

1.1. Do you own or rent your Lake County home? (*Fill in one circle*)

67% Own: primary home
32% Own: secondary home
1% Rent: I do not own this home

1.2. In a typical year, what months do you spend any time at your Lake County home? (*Fill in all that apply*)

(n=157) all_months	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	no_months
All 12 months	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	No months
78%	89%	88%	89%	85%	85%	89%	93%	93%	88%	83%	83%	85%	3%

rentout (n=146)

1.3. Do you rent out your Lake County home to others? (*Fill in one circle*)

89% No, I do not rent out my home
7% Yes, I rent out my home short-term
4% Yes, I rent out my home long-term

fulltime (n=155)

1.4. In what year did you move to your Lake County home? (*Fill in the blank*)

AVERAGE = 2006

yrbuild (n=155)

1.5. In what year was your Lake County home originally built? (*Fill in the blank*)

AVERAGE = 1988

riskawar (n=157)

1.6. How aware of wildfire risk were you when you bought or decided to rent your Lake County home? (*Fill in one circle*)

43% Very aware
41% Somewhat aware
12% Not aware
3% Don't remember

Section 2: In this section, we ask about your experience with, and preparation for, wildfire at your Lake County home.

fire (n=160)

2.1. What is the closest distance (as a crow flies) a wildfire has come to your Lake County property? (*Fill in one circle*)

1%	There has been a wildfire on my property
1%	Less than 2 miles away but not on my property
26%	2 to 10 miles away
44%	More than 10 miles away
28%	Not sure

2.2. Have you had any of the following wildfire experiences at your Lake County home? (*Fill in one circle per row*)

		No	Yes
evacuated (n=158)	I have evacuated from my Lake County home due to a wildfire or threat of a wildfire	99%	1%
smokedam (n=158)	My Lake County home has had wildfire smoke damage	99%	1%
firedam (n=158)	My Lake County home has had wildfire damage	99%	1%
destroy (n=158)	My Lake County home was destroyed by a wildfire	99%	1%

2.3. Do you currently have an evacuation plan in the event a wildfire threatens your Lake County home? (*Fill in one circle per row*)

		No	Yes	Not applicable
evacppl (n=157)	For the people in my household	41%	59%	
evacpets (n=156)	For the pets in my household and on my property	30%	42%	28%
evaclivstoc (n=154)	For livestock on my property	9%	3%	88%

2.4. Have you completed any of the following actions to prepare for a wildfire **evacuation** and do you want more information about how to complete any of the actions? (*Fill in two circles per row, one for each question*)

(n=160)	Completed action?		Want more information about the action?	
Identify how I will be notified about an evacuation	evacact1_a	25%	evacinfo1_a	57%
Sign up for a wildfire evacuation notification system (Everbridge Emergency Alert Program)	evacact2_a	22%	evacinfo2_a	61%
Identify safe evacuation routes (multiple, if possible)	evacact3_a	50%	evacinfo3_a	34%
Identify a location that my household will evacuate to	evacact4_a	48%	evacinfo4_a	33%
Identify what to take and what to leave behind during an evacuation	evacact5_a	50%	evacinfo5_a	31%
Discuss evacuation with my neighbors	evacact6_a	18%	evacinfo6_a	43%
Create a checklist for steps to take before evacuating	evacact7_a	22%	evacinfo7_a	47%
Identify a place to stay during a long-term evacuation	evacact8_a	45%	evacinfo8_a	31%
Pack a "go bag" with items needed during an evacuation	evacact9_a	31%	evacinfo9_a	39%
Provide evacuation information to renters, if applicable	evacact10_a	14%	evacinfo10_a	19%

2.5. Please tell us about your experiences with your **homeowners insurance** for your Lake County home. (*Fill in one circle per row*)

		No	Yes	Don't know
insure9 (n=160)	Do you currently have homeowner's insurance?	3%	97%	
insure2 (n=159)	Has an insurance company ever provided information on reducing wildfire risk?	52%	31%	17%
insure3 (n=159)	Has an insurance company ever refused to provide or renew insurance because of wildfire risk?	82%	11%	6%
insure4_a (n=156)	Has an insurance company charged a higher premium because of wildfire risk?	37%	24%	40%
insure10_a (n=158)	Has an insurance company ever given you a discount on your premium because you have reduced wildfire risk on your property?	68%	11%	21%
insure12 (n=158)	Do you think your home is adequately insured against loss from a wildfire?	16%	59%	25%
insure13_a (n=159)	Has an insurance company ever required you to take action to reduce wildfire risk in order to continue coverage?	91%	6%	3%
insure15 (n=157)	Has an insurance company offered private firefighting services?	91%	4%	4%

Section 3: In this section, we ask about the characteristics of your Lake County home and the area near your Lake County home.

3.1. Does your Lake County home have any of the following roofing materials? (*Fill in all that apply*)

(n=158)

rooftype1	Tile, metal, or asphalt shingles	99%
rooftype2	Wood (shake shingles)	2%

3.2. Does your Lake County home have any of the following exterior siding materials? (*Fill in all that apply*)

(n=156)

sidetype1	Noncombustible siding (tile, metal, brick, asphalt)	29%
sidetype2	Log or heavy timbers	10%
sidetype2_a	Maintained wood	56%
sidetype3_a	Weathered wood or vinyl	15%

attachcomb (n=158)

3.3. Does your Lake County home have a **combustible** balcony, deck, porch, or fence attached to the structure? (*Fill in one circle*)

18%	No
82%	Yes

combust_b (n=158)

3.4. What is the **closest** distance from your Lake County home to combustible items other than vegetation such as lumber, firewood, a propane tank, hay bales, flammable outdoor furniture, or other materials that could easily ignite, including an outbuilding/shed, detached garage, or other structure on your property? (*Fill in one circle*)

40%	More than 30 feet or no combustible items
37%	10 – 30 feet
9%	5 – 9 feet
13%	Less than 5 feet

closeveg_a (n=157)

3.5. What is the **closest** distance from your Lake County home to overgrown, dense, or unmaintained vegetation? (*Fill in one circle*)

38% More than 100 feet

41% 30 – 100 feet

18% 5 – 29 feet

3% Less than 5 feet

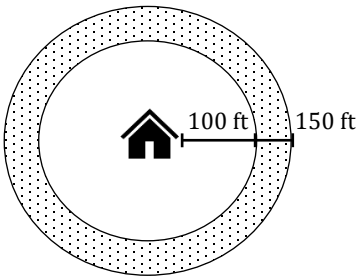
domveg_a (n=157)

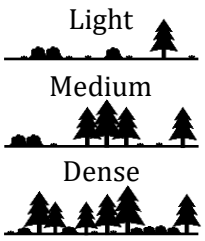
3.6. Which of the following best describes the **majority** of vegetation on your Lake County property between 100 and 150 feet from your home (the shaded part of the circle in the figure below)? That area might be outside your property boundary and include properties immediately surrounding you. (*Fill in one circle*)

6% Light: Grasses with isolated brush

71% Medium: Sparse brush and/or isolated trees (e.g., Lodgepole/aspen mix, thinned lodgepole stands with canopy separation)

23% Dense: Dense brush and/or dense trees (e.g., continuous closed canopy lodgepole pine)





closehome (n=157)

3.7. What is the **closest** distance from your Lake County home to a neighboring home outside of your property? (*Fill in one circle*)

50% More than 100 feet

36% 30 - 100 feet

12% 10 – 29 feet

2% Less than 10 feet

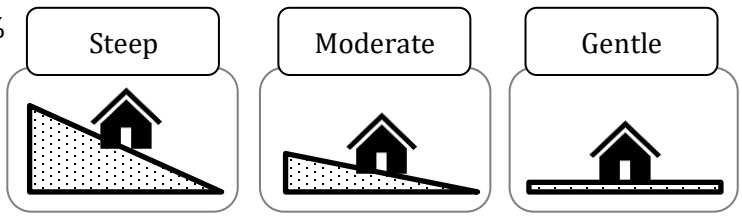
slope (n=159)

3.8. The slope of a property refers to the steepness of the land. A large property may have steep, moderate, and gentle slopes. How would you describe the average slope **within 150 feet** of your Lake County home? (*Fill in one circle*)

3% Steep – Greater than 45%

26% Moderate – 20% to 45%

72% Gentle – Less than 20%



ridge (n=156)

3.9. What is the **closest** distance from your Lake County home to a ridge, steep drainage, or narrow canyon? (*Fill in one circle*)

89%	More than 150 feet
6%	50 – 150 feet
5%	Less than 50 feet

3.10. Do any of the following describe your driveway? My driveway... (Fill in one circle per row)

		No	Yes
drivewayv (n=151)	has an overhead obstruction (e.g., tree limbs) lower than 15 feet	88%	12%
drivewayw_b (n=153)	is narrower than 20 feet wide	65%	35%
drivewayl_a (n=152)	is longer than 150 feet	78%	22%
turnarnd_a (n=152)	has room for a fire truck to turn around	59%	41%

3.11. Do any of the following describe your address number? My address number… (*Fill in one circle per row*)

		No	Yes
homenum_a (n=153)	is posted at the end of my driveway?	40%	60%
reflect_a (n=145)	is reflective?	74%	26%
homenum4in (n=157)	has 4-inch numerals?	22%	78%
homenumcontrast (n=150)	is on a contrasting background (white letters on blue background)?	33%	67%
homenumcombust (n=151)	is made of noncombustible materials?	36%	64%

roads (n=158)

3.12. If the road you use to access your Lake County home was blocked due to a wildfire, is there another road you could use to get out of your community? (Fill in one circle)

39%	No
61%	Yes

riskrate (n=158)

3.13. Properties in your community are assessed for overall wildfire risk based on the items asked about in questions 3.1 – 3.12 above. What do you think is your Lake County property's current overall wildfire risk rating? (Fill in one circle)

14%	Low risk
60%	Moderate risk
20%	High risk
3%	Very high risk
3%	Extreme risk

Section 4: In this section, we ask about wildfire risk reduction activities.

talkfire (n=159)

4.1. Have you ever talked about wildfire issues with a neighbor? (*Fill in one circle*)

47% No

53% Yes

4.2. Have you done any of the following wildfire-related activities? (*Fill in one circle per row*)

		No	Yes
activities1 (n=158)	Removed large or dense vegetation near my Lake County home (e.g., trees, shrubs, brush)	18%	82%
activities7 (n=154)	Regularly cleared my roof and gutters of leaves and pine needles	22%	78%
activities8 (n=155)	Regularly mowed and raked around my Lake County home	26%	74%
activities2 (n=156)	Made my Lake County home more fire resistant (e.g., replaced roofing, siding, added hardscaping, added screening under eaves)	53%	47%
activities3 (n=157)	Helped neighbor(s) reduce vegetation on their properties	83%	17%
activities4 (n=157)	Helped reduce vegetation on community property (e.g., HOA, subdivision)	87%	13%
activities5 (n=154)	Reduced vegetation on nearby public lands (e.g., county, state, federal lands)	90%	10%
activities6 (n=157)	Participated in a community wildfire preparedness activity (e.g., meeting, chipper day)	86%	14%
activities9 (n=157)	Met with a wildfire professional at my Lake County home to evaluate and discuss my property's wildfire risk	72%	28%
activities11 (n=156)	Participated in a cost share program to reduce vegetation and wildfire risk	95%	5%
activities10 (n=158)	Interacted with public land managers (e.g., Colorado State Forest Service or U.S. Forest Service) about fuels reduction on nearby public lands	83%	17%
activities12 (n=157)	Applied for a Burn Permit in 2023	99%	1%

4.3. How much do you think each of the following factors contributes to the chances of a wildfire damaging your Lake County property **in the next 12 months**? (*Fill in one circle per row*)

		A lot	Somewhat	Not at all
contrib1 (n=154)	Vegetation on my property	23%	55%	21%
contrib2 (n=153)	Physical characteristics of my house or other buildings (ex. roofing or siding) on my property	19%	58%	23%
contrib3 (n=153)	Vegetation on my neighbors' properties	28%	52%	20%
contrib4 (n=153)	Vegetation on nearby public or large undeveloped land	39%	42%	18%
contrib5 (n=151)	Lack of nearby water supply (ex. hydrant or cistern) for fire suppression	36%	30%	34%

neighboract (n=149)

4.4. How many of your immediate neighbors have taken action to reduce wildfire risk on their properties (ex. removing vegetation or replacing combustible siding) (*Fill in one circle*)

2%	All my neighbors have taken action
16%	Most of my neighbors have taken action
57%	Some of my neighbors have taken action
25%	None of my neighbors have taken action

4.5. How acceptable are the following land management approaches to **reducing wildfire risk** in Lake County to you? (*Fill in one circle per row*)

		Extremely acceptable	Very acceptable	Moderately acceptable	Slightly acceptable	Not at all acceptable
accept1_a (n=155)	Removing trees and other vegetation (thinning) on nearby public lands	35%	34%	22%	6%	3%
accept19 (n=154)	Creating a fuel break on nearby public lands by removing all trees in a strip/corridor next to a community or other values at risk	34%	29%	22%	9%	6%
accept20 (n=153)	Removing all trees in a defined area (about 2 to 6 acres) on nearby public lands (patch cut)	16%	25%	26%	18%	16%
accept9 (n=154)	Removing trees and other vegetation along roadways for safer evacuation and emergency response	34%	29%	18%	12%	6%
accept2 (n=154)	Burning piles of vegetation (slash piles) on nearby public lands	36%	28%	24%	6%	6%
accept3 (n=152)	Conducting a prescribed fire ignited by fire professionals on nearby public lands	26%	26%	27%	12%	9%
accept4_a (n=152)	Allowing a naturally ignited fire to burn on nearby public lands, when and where appropriate	22%	22%	31%	16%	9%
accept14 (n= 150)	Removing trees and other vegetation on HOA property surrounding communities	25%	29%	25%	11%	9%
accept18 (n=153)	Burning piles of vegetation (slash piles) on my or nearby *private* land	17%	20%	22%	22%	20%

4.6. Land management actions to reduce wildfire risk can be grouped into two approaches: (1) burning vegetation and (2) manual or mechanical vegetation removal. How will these two approaches affect the following? *(Fill in two circles per row, one for each approach)*

		Approach 1: Burning vegetation				**Approach 2: Manual/mechanical vegetation removal**		
		Improves	Neither	Worsens		Improves	Neither	Worsens
Look of landscape in the first few years	mgmtaffect1 (n=143)	15%	27%	58%	mgmtaffect6 (n=141)	40%	28%	32%
Long-term look of the landscape	mgmtaffect2 (n=143)	55%	29%	16%	mgmtaffect7 (n=141)	63%	28%	9%
Forest health	mgmtaffect3 (n=143)	85%	9%	6%	mgmtaffect8 (n=141)	86%	11%	4%
Water quality	mgmtaffect4 (n=139)	24%	45%	30%	mgmtaffect9 (n=136)	35%	59%	6%
Recreation opportunities	mgmtaffect5 (n=140)	28%	49%	24%	mgmtaffect10 (n=138)	37%	55%	8%

4.7. How acceptable are the following policy or regulatory approaches to **reducing wildfire risk** in Lake County to you? (*Fill in one circle per row*)

		Extremely acceptable	Very acceptable	Moderately acceptable	Slightly acceptable	Not at all acceptable
accept6 (n=148)	Growth policies or land use regulations that limit new development in fire-prone areas in Lake County	26%	39%	24%	7%	4%
accept7 (n=150)	Building codes that require fire resistant materials for structures located in fire-prone areas	33%	39%	21%	3%	4%
accept8 (n=149)	Development standards that require vegetation management (e.g., removing trees and mowing grass) on lots located in fire-prone areas	30%	34%	26%	5%	5%
accept12 (n=149)	Temporarily shutting off the power grid during extreme fire risk days to avoid wildfire ignitions	19%	32%	26%	11%	12%

Section 5: In this section, we ask about your notions, expectations, and risk perceptions related to wildfire.

5.1. How much do you agree or disagree with the following statements about wildfire? (*Fill in one circle per row*)

		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
state2 (n=156)	With proper technology, we can control most wildfires.	5%	28%	35%	24%	8%
state3 (n=158)	We should put out wildfires that threaten human life.	56%	37%	4%	1%	2%
state4_a (n=156)	We should put out wildfires that threaten homes.	40%	45%	13%	1%	1%
state5 (n=156)	During a wildfire, saving homes should be a priority over saving forests.	28%	40%	22%	6%	4%
state6 (n=157)	Wildfires are a natural part of a healthy forest/ecosystem.	47%	43%	6%	1%	3%
state11 (n=158)	I live here for the trees and will not remove any of them to reduce wildfire risk.	2%	5%	15%	45%	33%
state13 (n=158)	Managing the wildfire danger is a government responsibility, not mine.	2%	2%	20%	53%	23%
state14 (n=155)	Homeowners' actions to reduce wildfire are not effective.	1%	2%	20%	47%	30%
state15 (n=157)	My property is at risk of wildfire.	18%	48%	21%	10%	3%
state17 (n=157)	My effort to reduce wildfire risk on my property is not effective because of the heavy vegetation on my neighbors' properties.	4%	24%	33%	34%	4%
state19 (n=157)	Local firefighters have sufficient resources to keep a wildfire from spreading.	2%	4%	38%	38%	18%
state20 (n=157)	Local firefighters have sufficient resources to protect threatened homes.	2%	11%	38%	33%	16%
state21 (n=158)	Firefighters should put their lives at risk to protect my home.	3%	1%	7%	39%	51%
state22 (n=156)	Wildfires threaten my community water supply.	8%	22%	44%	22%	4%
state24 (n=158)	I plan to move out of the area in the next 12 months because of wildfires.	0%	0%	2%	22%	77%
state25 (n=158)	Development in fire-prone areas of Lake County increases the wildfire risk to my Lake County property.	11%	30%	39%	15%	4%

5.2. If there is a wildfire on your Lake County property, how likely do you think it is that the following would occur? (*Fill in one circle per row*)

		Extremely likely	Very likely	Moderately likely	Slightly likely	Not at all likely	Not applicable
lact1 (n=155)	I would put the fire out.	3%	13%	16%	22%	45%	1%
lact2 (n=154)	The fire department would save my home.	3%	18%	49%	24%	7%	0%
lact3 (n=153)	My home would have smoke damage.	14%	53%	27%	6%	1%	0%
lact4 (n=152)	My home would have some physical damage.	15%	44%	30%	9%	1%	1%
lact5 (n=153)	My home would be destroyed.	5%	27%	42%	20%	5%	1%
lact6 (n=152)	I would lose money due to the loss of business or income on my property.	10%	13%	11%	7%	17%	43%
lact7 (n=154)	My trees and landscape would burn.	22%	43%	22%	9%	3%	1%
lact9 (n=152)	My neighbors' homes would be damaged or destroyed.	9%	37%	35%	14%	1%	4%
lact12 (n=153)	Direct flame would ignite my home.	12%	35%	25%	22%	5%	1%
lact13 (n=152)	Embers would ignite my home.	9%	32%	32%	20%	7%	1%
lact14 (n=153)	Nearby homes would ignite my home.	7%	23%	24%	24%	20%	1%

chances1 (n=151)

5.3. What do you think is the chance that a wildfire will be on your Lake County property **in the next 12 months**? (*Fill in one circle*)

For sure										No chance
100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
0%	0%	1%	3%	1%	12%	4%	13%	25%	34%	7%

chances2 (n=152)

5.4. If there is a wildfire on your property **in the next 12 months**, what do you think is the chance that it will destroy or severely damage your Lake County home? (*Fill in one circle*)

For sure										No chance
100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%

9% 13% 7% 11% 6% 21% 7% 9% 7% 9% 2%

Section 6: In this section, we ask where you get information about wildfire, how useful the information is, how you receive information, and how you would like to receive information.

6.1. The following sources provide information about wildfire risk. If you have received information from one of these sources, how useful has it been? (*Fill in one circle per row*)

		HAS Received info from source		Usefulness of information among respondents who received information from the source (sums to ~100%)				
				Extremely useful	Very useful	Moderately useful	Slightly useful	Not at all useful
Leadville/Lake County Fire Rescue	sourcerec1 (n=152)	32%	sourceuse1 (n=49)	4%	39%	43%	12%	2%
Community group (e.g., homeowners association)	sourcerec2 (n=154)	21%	sourceuse2 (n=33)	15%	21%	36%	15%	12%
Community wildfire ambassador	sourcerec25 (n=152)	9%	sourceuse25 (n=14)	7%	29%	14%	43%	7%
Local arborist/contractor	sourcerec28 (n=152)	21%	sourceuse28 (n=32)	19%	22%	31%	19%	9%
Lake County Office of Emergency Management	sourcerec32 (n=152)	20%	sourceuse32 (n=30)	3%	43%	33%	17%	3%
Local government	sourcerec29 (n=151)	21%	sourceuse29 (n=32)	0%	31%	38%	28%	3%
Arkansas River Watershed Collaborative	sourcerec48 (n=151)	11%	sourceuse48 (n=16)	38%	13%	6%	31%	13%
Firewise USA®	sourcerec5 (n=150)	9%	sourceuse5 (n=13)	15%	23%	15%	31%	15%
Ready, Set, Go! Program	sourcerec24 (n=150)	11%	sourceuse24 (n=17)	12%	29%	29%	12%	18%
Colorado Parks and Wildlife	sourcerec49 (n=148)	20%	sourceuse49 (n=30)	7%	20%	50%	17%	7%
Colorado State Forest Service (e.g., Live Wildfire Ready Program)	sourcerec6 (n=151)	34%	sourceuse6 (n=52)	15%	37%	33%	13%	2%
USDA Forest Service (San Isabel)	sourcerec14 (n=150)	22%	sourceuse14 (n=33)	6%	39%	36%	15%	3%
National Park Service	sourcerec34 (n=148)	12%	sourceuse34 (n=18)	0%	28%	33%	28%	11%
Bureau of Land Management	sourcerec15 (n=147)	13%	sourceuse15 (n=19)	11%	32%	32%	11%	16%
Media (newspaper, TV, radio, internet)	sourcerec4 (n=147)	41%	sourceuse4 (n=61)	0%	13%	51%	31%	5%

6.2. How do you currently receive information about wildfire risk reduction, and how would you prefer to receive information? Please answer **both** questions for each row. (*Fill in all circles that apply*)

(n=160)	I receive information from this source		I would like to receive information from this source	
Email/e-newsletter	receiveinfo1_a	13%	wantinfo1_a	50%
Mailed newsletter	receiveinfo2_a	21%	wantinfo2_a	48%
Community meetings	receiveinfo3_a	14%	wantinfo3_a	28%
Conversations with local wildfire specialists	receiveinfo10_a	13%	wantinfo10_a	41%
Social media (Facebook, Twitter, Nextdoor)	receiveinfo5_a	11%	wantinfo5_a	16%
Internet (non-social media)	receiveinfo6_a	21%	wantinfo6_a	27%
TV news	receiveinfo7_a	26%	wantinfo7_a	16%
Newspaper	receiveinfo8_a	23%	wantinfo8_a	25%
Radio	receiveinfo9_a	8%	wantinfo9_a	19%

Section 7: In this section, we would like to know why you do or do not take action to reduce the risk of wildfire to your Lake County property.

7.1. Do any of the following **prevent you** from taking action to reduce the wildfire risk on your Lake County property (ex. cutting trees, changing roof/siding?)
(*Fill in all circles that apply for each row*)

(n=152)	factor1	factor2	factor3_a	factorno1
Personal resources	Financial cost 46%	Time to do the work 32%	Physical ability to do the work 32%	None of these 30%
(n=151)	factor11	factor4	factor12	factorno2 (n=151)
Lack of specific information about…	The factors contributing to my property's wildfire risk 19%	How to reduce wildfire risk on my property 30%	Where to dispose of vegetation/slash 22%	None of these 54%
(n=145)	factor6	factor5_a	factor13	factorno3
Personal perspectives	I do not want to change the way my property looks 12%	I do not think taking action would reduce my property's wildfire risk 16%	It's a low priority to me 12%	None of these 62%
(n=146)	factor14	factor9_a	factor15	factorno4
Community	Lack of options for disposing vegetation/slash 14%	Restrictions on the changes I can make to my property 8%	Social pressure from neighbors 4%	None of these 78%

7.2. Would any of the following **encourage you** to take action to reduce the wildfire risk on you Lake County property? (*Fill in all that apply for each row*)

(n=150)	incentv1	incentv3	incentv4	incentvno1
Resources	Cost-share or financial assistance 56%	Help doing the work 47%	Recommended contractors 27%	None of these 21%
(n=151)	incentv6	incentv7	incentv8	incentvno2
Information	A report describing my property's wildfire risk factors 53%	Videos showing how to reduce risk on a property in my area 22%	One-on-one visit with wildfire risk experts on my property 44%	None of these 28%
(n=144)	incentv9	incentv10	incentv11	incentvno3
Other	Feedback on the work I've done to reduce my property's risk 35%	Recognition for taking action 11%	Neighborhood group that organizes wildfire risk-reduction activities 27%	None of these 47%

Section 8: In this section, we ask about personal and household characteristics. Your name will never be connected to your answers in any way.

risktake1 (n=152)

8.1. In general, do you view yourself as someone who is very willing to take risks or not at all willing to take risks? (*Fill in one circle*)

Very willing to take risks										Not at all willing to take risks
10	9	8	7	6	5	4	3	2	1	0
2%	2%	9%	16%	16%	27%	6%	11%	7%	5%	1%

age (n=154)

8.2. What is your age? (*Fill in the blank*)

MEAN AGE: 60

gender (n=149)

8.3. Are you? (*Fill in one circle*)

50% Male

50% Female

0% Other

educ (n=154)

8.4. What is the highest grade or year of school you completed? (*Fill in one circle*)

2% Less than high school

6% High school graduate

11% Some college or technical school

6% Technical or trade school

29% College graduate

10% Some graduate work

36% Advanced degree (M.D., M.A., M.S., Ph.D., etc.)

employ (n=154)

8.5. Which of the following best describes your current employment situation? (*Fill in one circle*)

43% Employed full time (including self-employed)

11% Employed part time (including self-employed)

3% Unemployed or do not work outside of the home

44% Retired

income_a (n=142)

8.6. Which of the following categories describes your annual household income? (*Fill in one circle*)

7% Less than $24,999

9% $25,000 – $49,999

15% $50,000 - $74,999

15% $75,000 - $99,999

35% $100,000 - $199,999

18% $200,000 or more

Thank you for your help. Please use the space below to write any additional comments. Refer to the cover letter included in your mailing for contact information if you would like to schedule an onsite visit with a wildfire professional to learn how you can reduce risk on your property.

Appendix F: Outreach Materials

Begins on next page.

Understand your property's WILDFIRE RISK

Lake County, CO

RAPID WILDFIRE RISK ASSESSMENTS

We conducted a rapid wildfire risk assessment of your property. This 60-second evaluation was performed from the road by trained assessors.

We observed factors that affect the chances of your home catching fire. Additionally, we looked at the vegetation and combustible items immediately surrounding your home, the type and density of vegetation around the property that can influence wildfire behavior, and features that could impact access to your home during a wildfire.

+

HOUSEHOLD SURVEY RESULTS

In 2023, we mailed **683 surveys** on wildfire risk to households in the Lake County study area. The survey covered a wide range of topics, including the acceptability of wildfire-related policies and fuel treatments, parcel-level wildfire risk perceptions, barriers and incentives to action, communication preferences, and more.

We received **161 completed surveys,** a **24% response rate.** Thank you to all of those who participated!

RECOMMENDED HOMEOWNER ACTIONS

- ✓ COMPLETE EVACUATION PREPARATIONS
- ✓ CREATE AND MAINTAIN DEFENSIBLE SPACE

For more details, see page 2

REGISTER
for alert notifications

Visit tinyurl.com/Lake-County-Alerts or scan the QR code to the left.

STAY INFORMED

Visit the Lake County Office of Emergency Management's Facebook page at www.facebook.com/LCOEM or scan the QR code to the left.

CREATE
an evacuation plan

Visit bit.ly/CSU-Evacuation-Guide or scan the QR code to the left.

Evacuation preparation

Emergency notiification

- Identify how I will be notified about an evacuation.
- Sign up for a wildfire evacuation notification system.

Where to evacuate

- Identify safe evacuation routes (multiple routes, if possible).
- Identify a location that my household will evacuate to.
- Identify a place to stay during a long-term evacuation.

Other critical steps

- Create a checklist for steps to take before evacuating.
- Identify what to take and what to leave behind during an evacuation.
- Pack a "go" bag with important items needed during an evacuation.
- Discuss evacuation with neighbors.

Leadville/Lake County Fire-Rescue

Leadville/Lake County Fire-Rescue (LLCFR) provides fire protection and emergency response to the City of Leadville and the County of Lake as a consolidated fire rescue service. An all-hazards, community based agency, LLCFR dedicates itself to reducing community risk through excellence in emergency service.

719-486-2990
www.lakecountyco.com/218/Fire
816 Harrison Avenue
Leadville, CO 80461

Colorado State Forest Service

The Colorado State Forest Service (CSFS) provides technical forestry assistance, wildfire mitigation expertise, and outreach and education to help landowner and communities achieve their forest management goals. The CSFS's mission is to achieve the stewardship of Colorado's diverse forest environments for the benefit of present and future generations.

719-539-2579
csfs_salida@mail.colostate.edu
csfs.colostate.edu/salida
7980 West Highway 50
Salida, CO 81201

Arkansas River Watershed Collaborative

The Arkansas River Watershed Collaborative (ARWC) leads initiatives to restore important ecosystems, mitigate wildfire risks, and ensure the resilience of its landscapes and communities.

arkcollaborative.org
Leadville Office
901 US-24
Leadville, CO 80461
(Please contact ARWC before visiting the office.)

Understand your home's
DEFENSIBLE SPACE

ZONE 1 (0–5 feet from home)

73% Respondents reported having this much defensible space

21% Trained assessors reported homes having this much defensible space

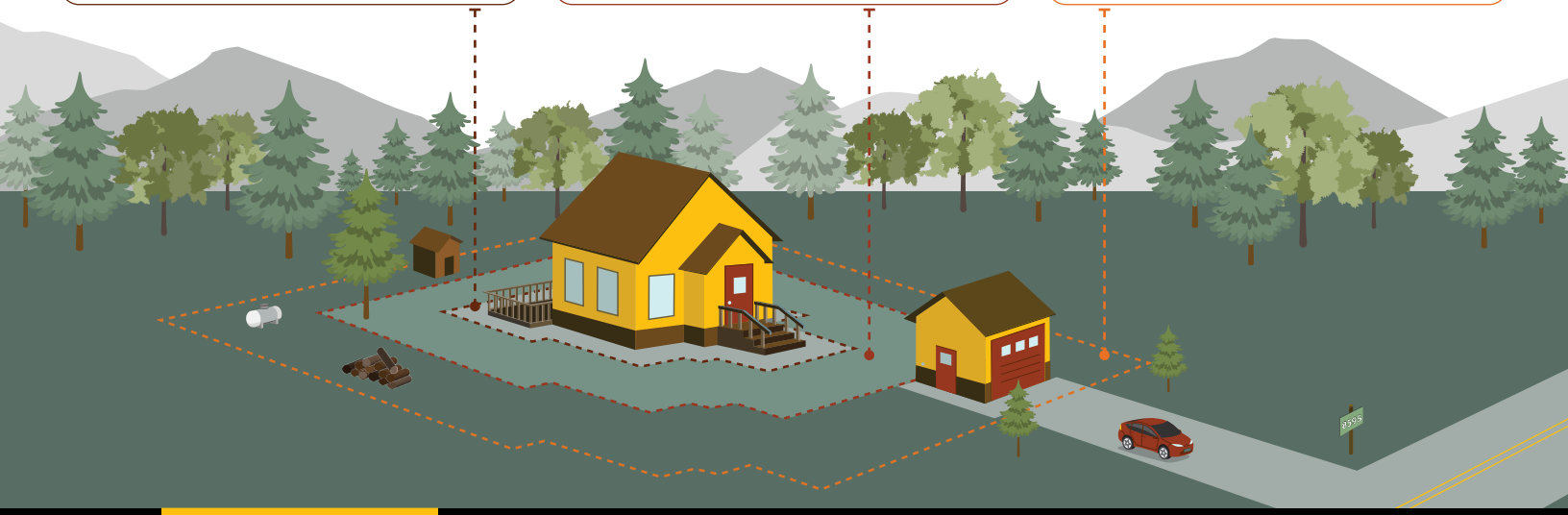
ZONE 2 (5–30 feet from home)

34% Respondents reported having this much defensible space

2% Trained assessors reported homes having this much defensible space

ZONE 3 (30–100 feet from home)

This zone focuses on mitigation to slow or stop the spread of wildfire and helps protect your home. Where property lines meet, homeowners are encouraged to work with neighbors to reduce risk.



Create and maintain defensible space.

- **Defensible space** is the area around a home or structure that has been modified to reduce fire hazard. This is achieved by clearing, pruning, or spacing out combustible items.
- **Combustible items** refer to materials or objects that can easily catch fire or contribute to the spread of flames. Examples include live or dead vegetation, outdoor furniture, propane tanks, firewood, or detached garages.

Start with your home and the first 5 feet surrounding it.

HOMEOWNER TO-DO LIST

- ☐ Regularly remove all pine needles and other debris from your home's roof, deck, and gutters, as well as under deck.
- ☐ Move firewood and propane tanks at least 30 feet away from your home.
- ☐ Prune tree branches hanging over your home's roof and remove all combustible items within 10 feet of the chimney.
- ☐ Remove all flammable vegetation within 5 feet of your home and deck, including shrubs, slash, mulch, and other woody debris.
- ☐ Refinish wood decks (e.g., sand or stain).

LEARN more about defensible space

Visit bit.ly/CSFS-HIZ-Guide or scan the QR code to the left.

SCHEDULE a free home assessment

Meet with the Colorado State Forest Service at your home or property to discuss site-specific wildfire risks and mitigation strategies.

719-539-2579

csfs_salida@mail.colostate.edu

To learn more about RMRS publications or search our online titles:

www.fs.usda.gov/research/rmrs/products/publications

www.fs.usda.gov/research/treesearch