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Living with Wildfire in Cooper Landing, Alaska: 2023 Data Report

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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 Cooper Landing, Alaska, 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 the Kenai Peninsula Borough Office of Emergency Management and Cooper Landing Emergency Services to inform decisions about wildfire adaptation. 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 indicated a community that was engaged in preparing for and mitigating the risk of wildfire yet had more that could be done to reduce its risk.

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

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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. 2024. 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

Cooper Landing is a census-designated place on the Kenai Peninsula that rests at the confluence of the Kenai and Russian Rivers. Surrounded by the Chugach National Forest, Cooper Landing draws tourists and seasonal residents to ample fishing, rafting, and hiking opportunities. This small fire-prone community is served by a volunteer fire department. In 2023, Cooper Landing Emergency Services (CLES) and the Kenai Peninsula Borough Office of Emergency Management (KPB OEM) partnered with the Wildfire Research (WiRē) team to collect local data to improve understanding of residents' wildfire mitigation and preparedness activities and their support of wildfire mitigation in and around the Cooper Landing area.

The effort prioritizes two types of data: parcel-level rapid wildfire risk assessment data and household survey data. We followed the Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA) protocol, which measures parcel-level risk as the sum of a set of 13 attributes related to access to the property, background fuels and topography, vegetation near the home, and home structure characteristics.

First, WiRē RAs were conducted on all accessible properties with residential structures within the study area, which included 297 residential structures on 288 parcels. Next, a social survey was sent to the owners of all households in the study area, collecting homeowners' self-assessment of their property's wildfire risk as well as a range of social data related to how survey respondents live with the risk of wildfire. The household survey was sent to 297 homeowners of which 147 returned a completed survey; this effort resulted in a 50 percent response rate. Overall, there were 123 properties for which a risk assessment paired with a household survey response. There are an additional 174 properties with only a risk assessment, for a total of 297 risk assessments in the study area. This report summarizes the results of the study.

Household survey respondents were generally aware of wildfire risk, with high levels of stated awareness (86% claimed to be somewhat or very aware of risk when they moved in; fig. 18). More notably, the majority (75%) strongly agreed or agreed with the statement "My property is at risk of wildfire," 95 percent agreed or strongly agreed that "Reducing wildfire risk on private property improves firefighter safety," and only 5 percent agreed or strongly agreed that "Homeowners actions to reduce wildfire risk are not effective" (figs. 21, 46). Relatedly, most respondents reported taking action to reduce wildfire risk, including reducing vegetation on their property (9%), clearing roof and gutters (79%), and mowing or raking around residence (73%; fig. 33). Despite these actions, a comparison between the WiRē RA and respondents' self-assessment indicates that while more than 60 percent of survey respondents reported at least 30 feet of defensible space, the WiRē RA found 13 percent of properties were clear of overgrown, dense, or unmaintained vegetation within 30 feet of the home (fig. 9). Further, the WiRē RA indicated that most properties had combustible items within 5 feet of the home (71%) and attached (98%) to the home (e.g., decks or fences; figs. 10, 7).

Results also indicated widespread interest in many programs for supporting mitigation on private property, including a majority of survey respondents reporting that they would be encouraged to take action by one-on-one visits with wildfire experts on their properties (58%) or by reports describing their properties' wildfire risk factors (51%) (fig. 39). More than one-third (39%) of survey respondents reported that they would be encouraged to take action if they had feedback on work that they have done to reduce their risk (fig. 40).

Respondents indicated engagement with multiple sources of wildfire risk information, including CLES (71%), KPB OEM (59%), and the Alaska Division of Forestry and Fire Protection (49%) (fig. 32).

Most survey respondents found public lands treatments highly acceptable, though variation in acceptability was observed based on the type of management technique. Notably, acceptability was particularly high for fuels treatments that reduce risk and support safe evacuation, including removing vegetation along utility right of ways (85% extremely/very acceptable), removing trees and other vegetation (thinning on nearby public lands) (82%), and roadside thinning for safer evacuation (77%) (fig. 41).

Finally, results indicated that evacuation was a concern, with the WiRē RA finding that 90 percent of properties had only one road to get out of the community during a wildfire (fig. 15) and 79 percent of homes lacked address signage that helps first responders during emergency events (fig. 14). Many respondents reported taking evacuation planning steps, including identifying what to take with them during an evacuation (73%), identifying safe evacuation routes (66%), and signing up for emergency notification (58%) (fig. 32). Despite this relatively high level of emergency preparedness, only 21 percent reported knowing the phone number to reach the Office of Emergency Management call center for information about a wildfire or other emergency.

Overall, the study indicated a community that was engaged in preparing for and mitigating the risk of wildfire yet had more that could be done to reduce its risk.

What is WiRē?

The Wildfire Research (WiRe) 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 Wildfire Research (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 and evacuation planning behaviors, 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 2023, the Kenai Peninsula Borough Office of Emergency Management (KPB OEM) engaged with the Wildfire Research (WiRē) Center to implement the WiRē Approach. The KPB OEM had just updated their Community Wildfire Protection Plan (CWPP) and were prioritizing community engagement with respect to wildfire risk mitigation and evacuation preparation. The KPB OEM identified Cooper Landing (refer to fig. 1) to be included in the WiRē project based on several characteristics: high risk communities with recent wildfire experience and resident engagement in wildfire mitigation and preparedness programs.

The community of Cooper Landing is within Chugach National Forest, which annually experiences some level of wildfire threat that continually encourages residents' awareness and the need to remove hazardous fuels within the Wildland Urban Interface (WUI) intermix. Their mitigation efforts began as a fledgling Firewise effort in 2014 among private property holdings working in collaboration with the State Division of Forestry and KPB OEM. Fast forward to today and the community is actively engaged in shared mitigation projects to reduce the threat of wildfire. The residents also actively provide public input on area restoration projects completed in the Chugach National Forest or the adjacent Kenai National Wildlife Refuge on the community's western border. Their activism and public engagement immediately brought them to the forefront as a WiRē community.

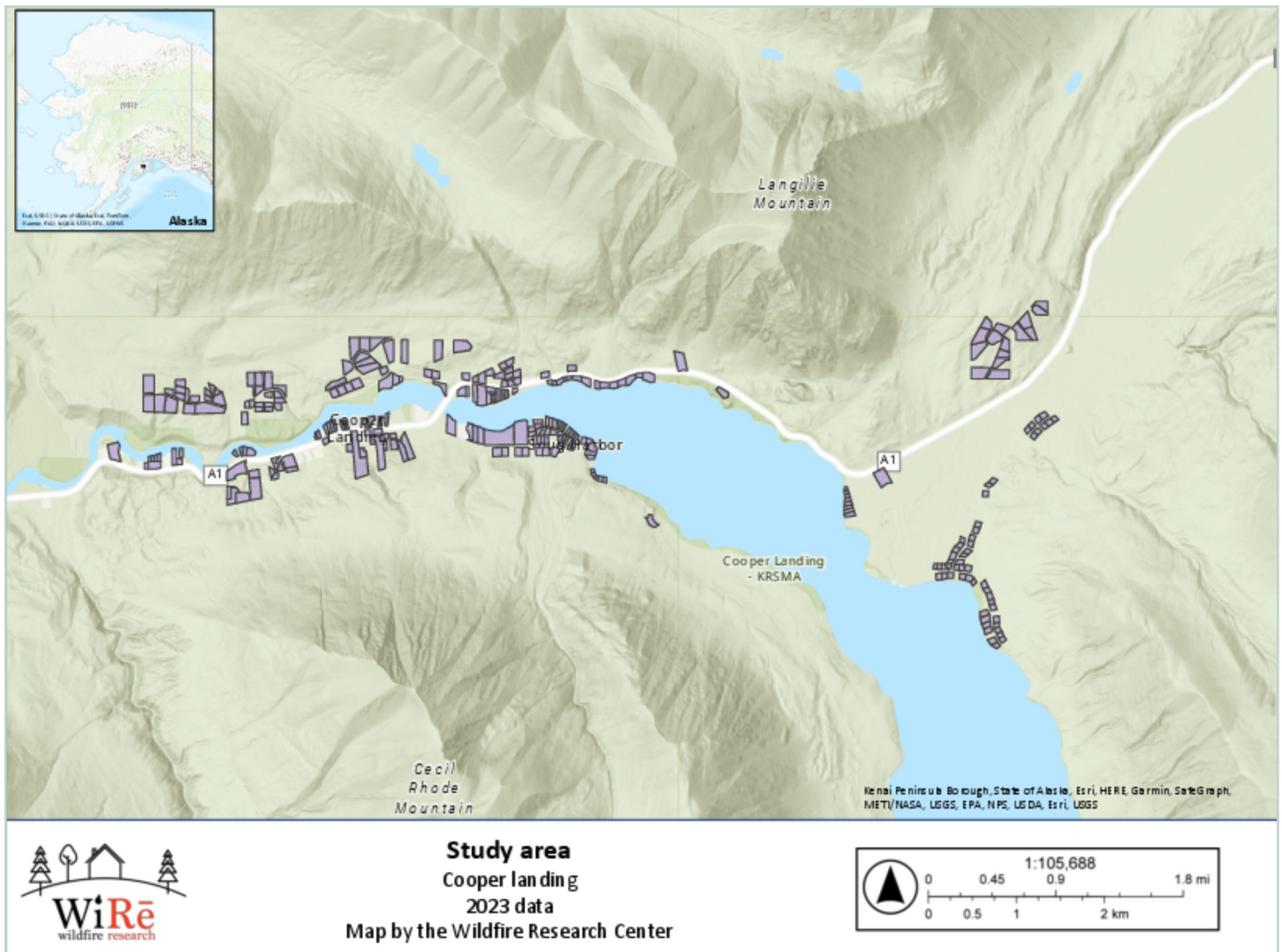


Figure 1—Map of residential parcels in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area. The inset map shows the location of the study area in Alaska. Map image is the intellectual property of Esri and is used herein under license. Copyright © 2020 Esri and its licensors. All rights reserved.

WiRē Partner: Kenai Peninsula Borough Office of Emergency Management and Cooper Landing Emergency Services

The KPB OEM has the primary day-to-day area-wide responsibility for natural and human-caused disaster management, community preparedness, and mitigation planning programs

and activities. The OEM actively participates in the interagency “All Lands / All Hands Action Plan,” a wildfire hazard mitigation plan to reduce community and individual vulnerability to wildfire hazards before they occur. Developed to reduce community and individual vulnerability to wildfires, this plan is a collaboratively developed, interagency multi-year plan designed to augment the implementation of mitigation tasks and prevention-based projects in alignment with the National Cohesive Wildland Fire Management Strategy. Participating landowners include local, State, Federal, private, and Tribal entities. The plan is designed to be a working document that presents a 5-year implementation schedule for all participating landowners for years 2023 through 2028. Recognizing that full implementation of the plan is contingent on available funding, the schedule provides a basis for identifying what landowners in the KPB can accomplish individually or cumulatively on an annual basis over the 5-year period.

Cooper Landing Emergency Services (CLES) is an unsupported 501 (c)(3) that operates with a combination department of one part time employee and over 20 volunteer responders. The CLES responds to approximately 100–150 calls each year, providing emergency services (fire and emergency medical service) to several hundred square miles of mountainous and wilderness terrain, as well as more than 70 miles of intrastate highway corridors (including large sections of the Seward and Sterling Highways) within the area of Cooper Landing, Alaska. The CLES also provides mutual aid response to neighboring departments in Moose Pass, Hope, and Sunrise.

Methods: What Did We Do?

In 2023/2024, WiRē partnered with the KPB OEM and CLES to implement the WiRē Approach. The study launched by mailing an initial letter in May 2023 to inform residents in the study area of the upcoming activities (Refer to Appendix A for correspondence materials and household survey). Next, trained assessors conducted the WiRē RA and household surveys were sent to homeowners. Additionally, WiRē, CLES, and KPB OEM developed a “leave behind” flyer to hand out to residents who wanted more information about the project (Refer to Appendix A).

Wildfire Research (WiRē) parcel-level Rapid Wildfire Risk Assessments

In the spring of 2023, the trained assessors conducted WiRē RAs on all accessible properties with a residential structure in the study area. A total of 297 WiRē RAs were conducted on 288 parcels.

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. The 13 attributes are weighted and summed to produce an overall risk score for each parcel (Refer to fig. 2). The weights reflect the attributes’ relative contribution (ranging from 1% to 30% per attribute) to overall 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 risk assessment attribute weightings.

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 cut-offs 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), and 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. In instances when an attribute could not be observed, the category “unknown/not observed” was selected. During data processing, these responses were assigned to the highest risk score.

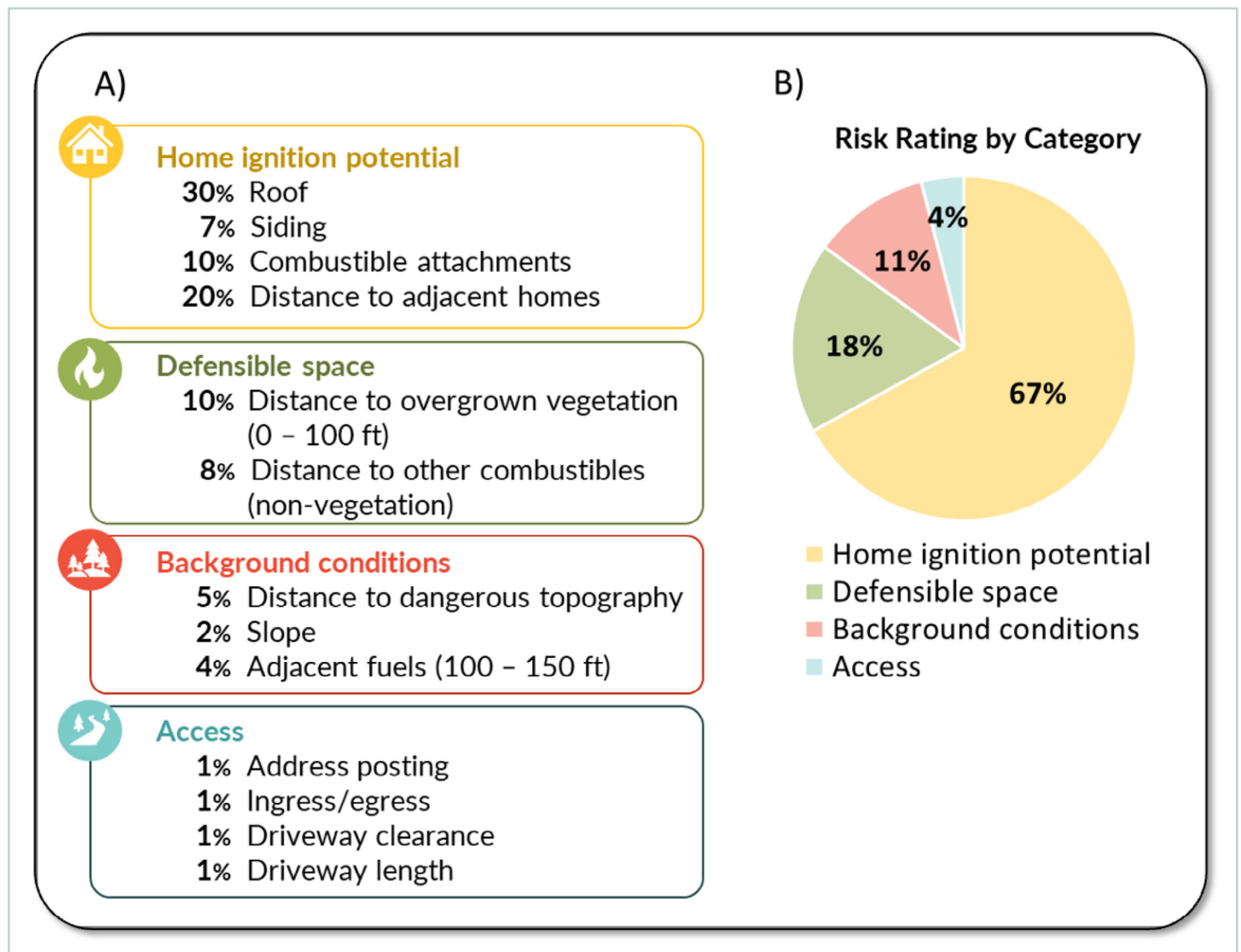


Figure 2—Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment (WiRē RA). (A) Relative weight of each risk attribute within the overall risk score. (B) Relative weight of each risk category within the overall risk score.

After receiving training by WiRē, the WiRē RAs were conducted by several wildfire professionals from the CLES, Chugach National Forest, and KPB OEM staff (hereafter referred to as the “trained assessors”). The trainings were comprised of the following two sessions:

- Training on and calibration of the WiRē RA attributes: conducted virtually on 4/26/23
- Training on the data collection tool: conducted in the field on 5/19/23.

In addition to the training sessions, WiRē provided two reference documents: (1) an Assessor Reference Guide that orients trained assessors to the data being collected and provides guidance on how to choose which response category reflects the condition observed at the parcel level and (2) Data Collection Instructions on how to use ArcGIS Field Maps (refer to Appendix B).

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 KPB OEM and CLES. The household survey was mailed to the homeowners of all the properties for which a WiRē RA was completed.¹ Household survey data were collected using a modified Dillman approach,² which includes three mailings after the initial letter announcing study activities and the data collection efforts (refer to table 1 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 one 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 one month after the reminder postcard.

The household survey was sent to 297 households. The number of surveys returned was 147, for a 49.5 percent response rate.

Table 1—Timing of the household survey administered to residents in the study area by the Kenai Peninsula Borough Office of Emergency Management, Cooper Landing Emergency Services, and Wildfire Research (WiRē) to collect information related to wildfire risk.

Mailing	Date of Mailing
Initial letter	5/19/2023
First survey package ³	2/12/2024
Postcard reminder	2/26/2024
Second survey package	4/01/2024

1 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 Wildfire Research (WiRē) parcel-level rapid wildfire risk assessments conducted.

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

3 A correction letter and postage were sent shortly after the first survey package to address the omission of postage on the return envelope (refer to Appendix A).

A Comparison of Risk Assessment: Results of the Wildfire Research (WiRē) Parcel-level Rapid Wildfire Risk Assessment and Household Survey

A total of 297 WiRē RAs were conducted by trained assessors. The trained assessors categorized the parcels' overall risk as follows: low risk (3%), moderate risk (10%), high risk (56%), very high risk (11%), or extreme risk (20%). For more details, refer to Appendix C, table 1.1.

The WiRē RA data were paired with the household survey data, for which there were 147 records, to produce 123 records with all the household survey and WiRē RA variables ("paired data," refer to fig. 3).⁴ The data used in the section below represent only the paired data—properties for which a household survey was completed and there is an associated WiRē RA.

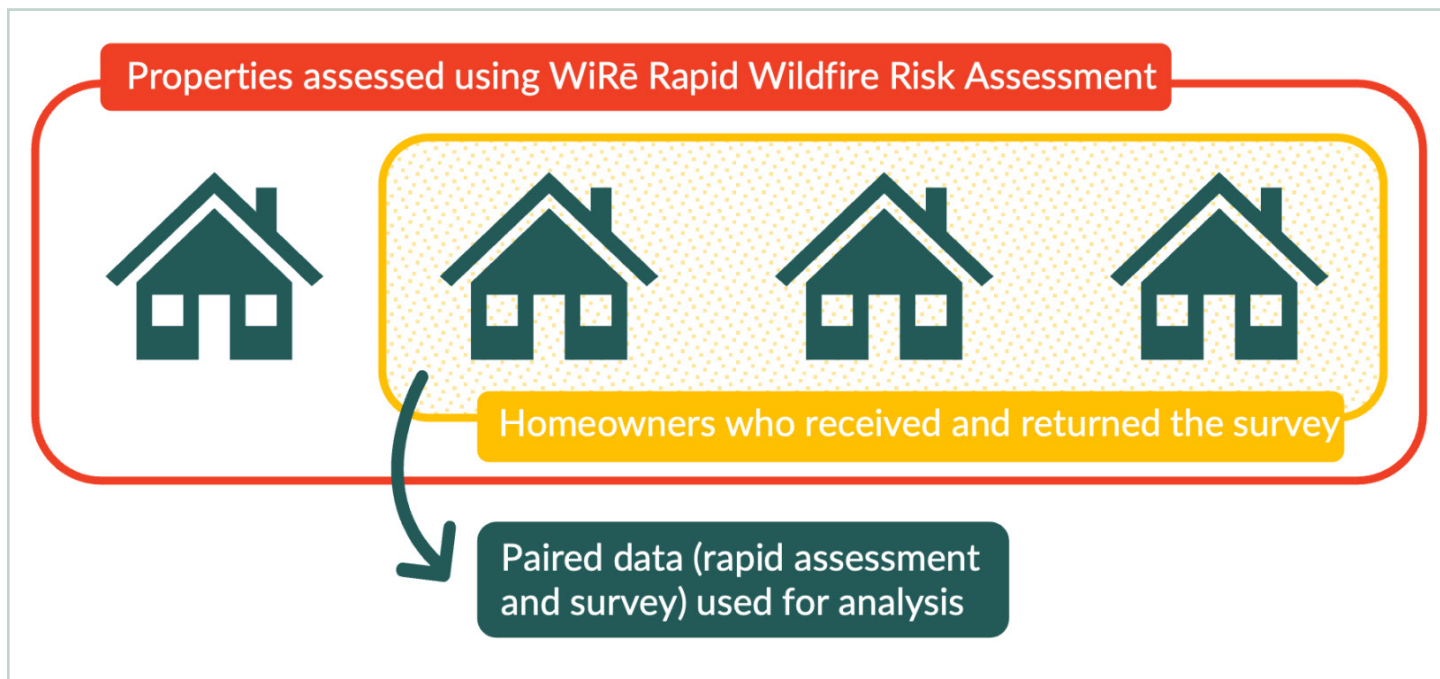


Figure 3—Representation of the Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment and household survey data collected in a WiRē project, which are combined to produce the paired data.

Statistical tests⁵ 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. No statistical differences were found.

Risk Attributes: Observed in the Wildfire Research (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 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.

⁴ Any differences between the numbers reported here and the comparison of the Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment and household survey (Appendix D) should be minor and the result of rounding.

⁵ Statistical tests included a *Two-sample Wilcoxon rank-sum (Mann-Whitney) test* and a *Pearson χ^2*

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 a summary assessment of their properties’ overall wildfire risk based on the 13 risk attributes. The survey question about overall wildfire risk offered five 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 overall ratings, the WiRē RA’s overall ratings were calculated as the sum of each individual risk attribute score with each risk category (i.e., low, moderate, high, very high, extreme) representing a specific numerical range. 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 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 (32%) rated their parcels as high risk of wildfire compared to the WiRē RA (59%). Most survey respondents (53%) rated their parcels as moderate risk of wildfire (refer to fig. 4).

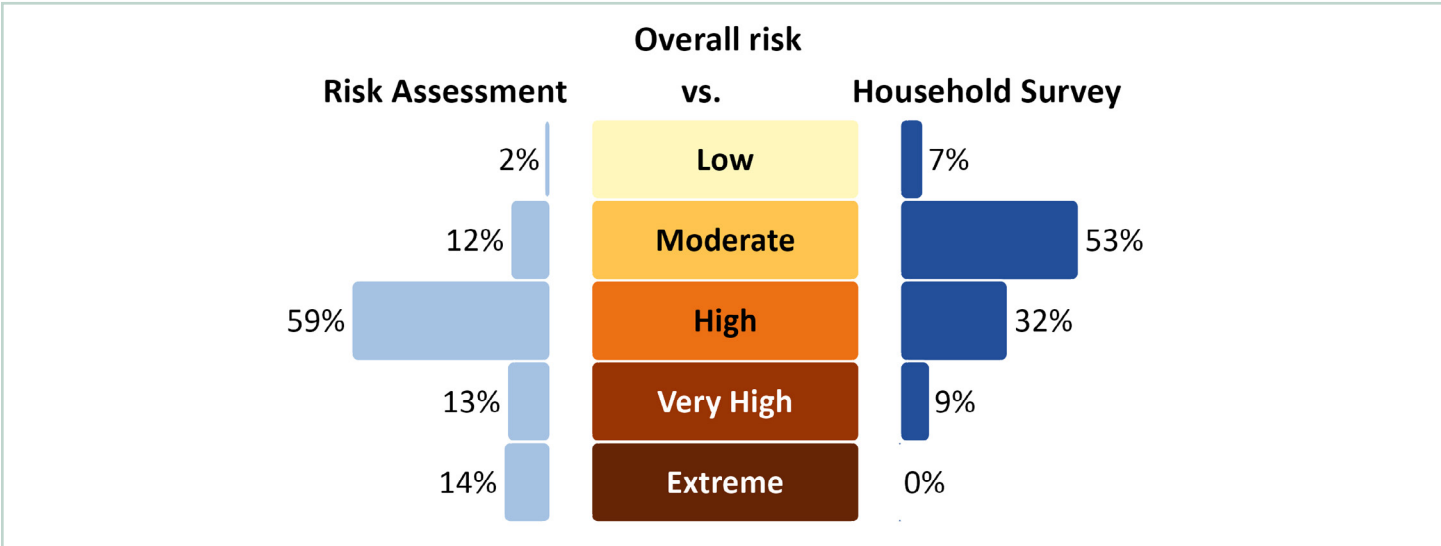


Figure 4—Distribution of overall risk rating. Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment data (WiRē RA). Represents 120 of the paired household survey and WiRē RA data records that each had a response to this question.

Home ignition potential—

Wildfire conditions can impose long periods of convective, conductive, and radiant heat on structures. These conditions test the limits of the materials used in construction. Both the design and home structure characteristics play a role in a structure’s ignitability.

Risk attribute: roof—

The roofing material of a structure is a critical component in determining home ignitability. These were either fire-resistant (noncombustible) materials such as metal, tile, and asphalt, or fire-receiving (combustible) materials such as wood shingles.

The WiRē RA data (89%) 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 (11%) than the survey response data (2%). Refer to figure 5.

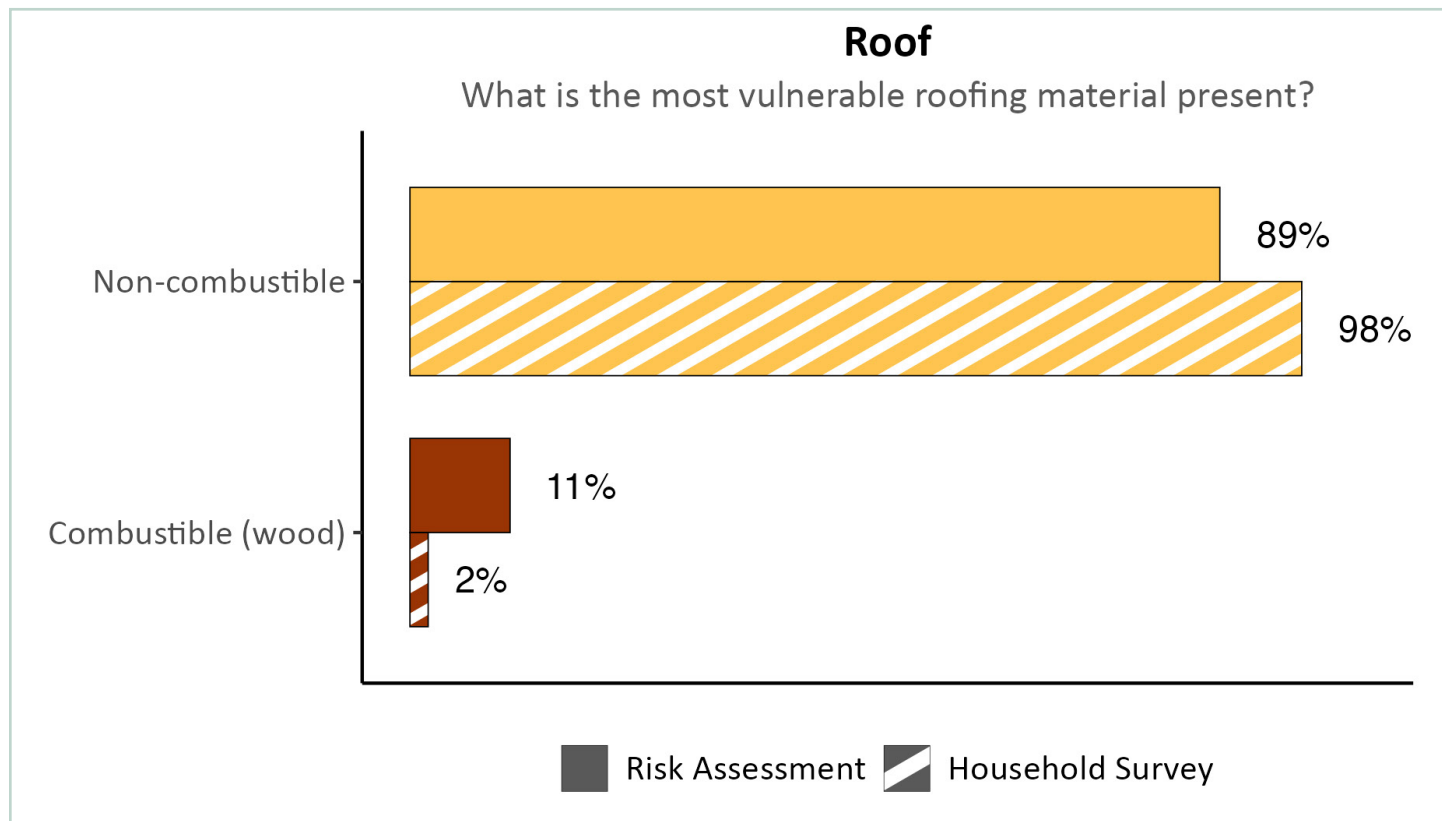


Figure 5—Combustibility of residential roof type. Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment data. N = 119

Risk attribute: siding—

A structure's exterior walls, including the materials used, contribute to the overall ignitability of a home in a wildfire event. The siding of homes was assessed into three categories: low-risk, noncombustible materials (e.g., stucco, brick, stone); medium-risk combustible materials (log or heavy timbers); or high-risk combustible materials (vinyl, wood).

Trained assessors and survey respondents categorized most homes' siding as wood or vinyl (84% and 60% respectively). However, more survey respondents reported noncombustible siding (16%) than in the WiRē RA data (1%). Refer to figure 6.

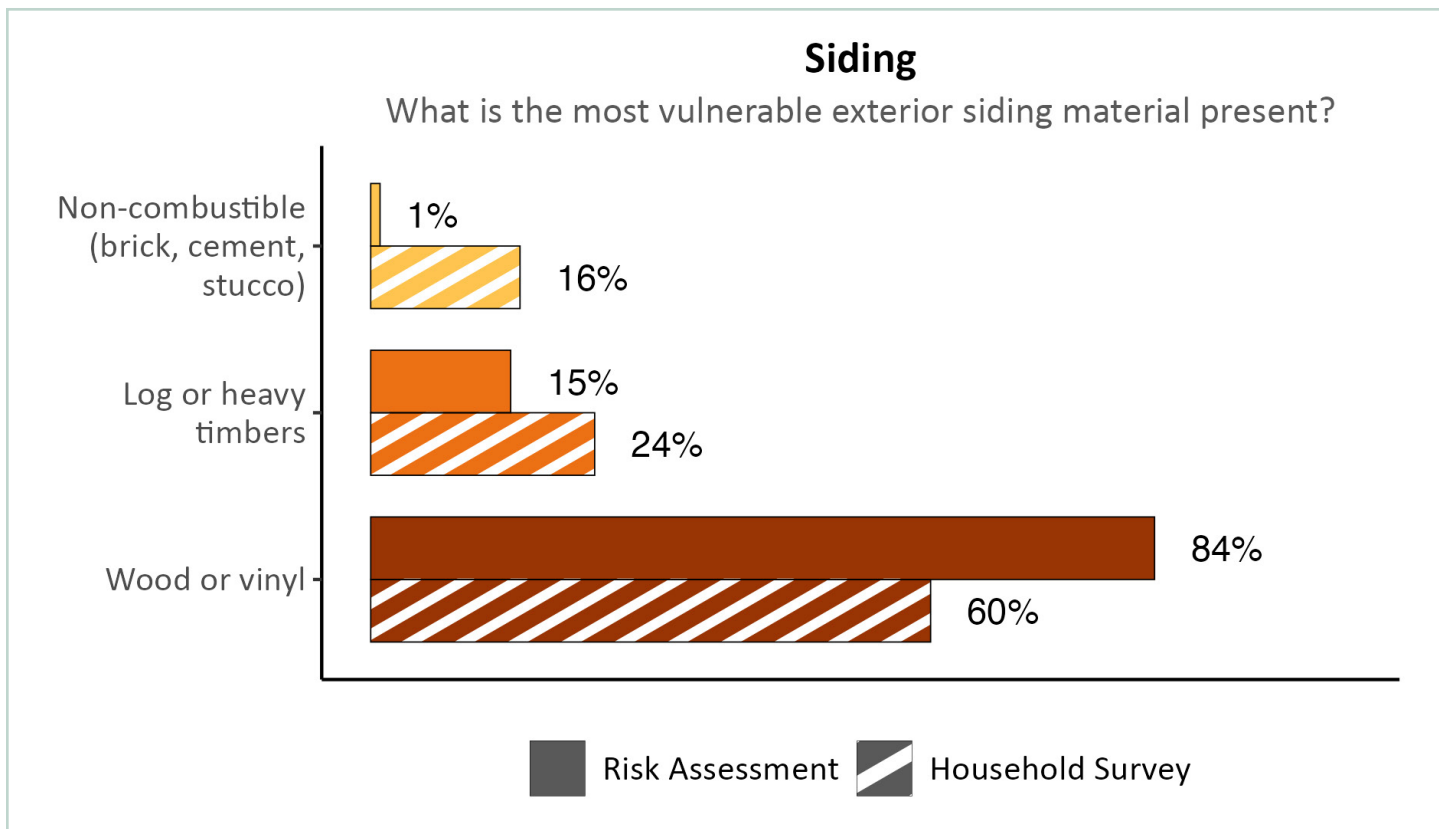


Figure 6—Residential exterior siding type, categorized by material into low, medium, and high-risk categories. Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment data. N = 120

Risk attribute: combustible attachments—

Attachments to structures (e.g., wooden decks, fences) increase the area exposed to blowing embers in a wildfire event and could increase ignition potential. Parcels were assessed by 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 (98%). Similarly, most survey respondents (87%) reported the presence of combustible attachments. However, more survey respondents (13%) reported the absence of combustible attachments compared to the WiRē RA (2%). Refer to figure 7.

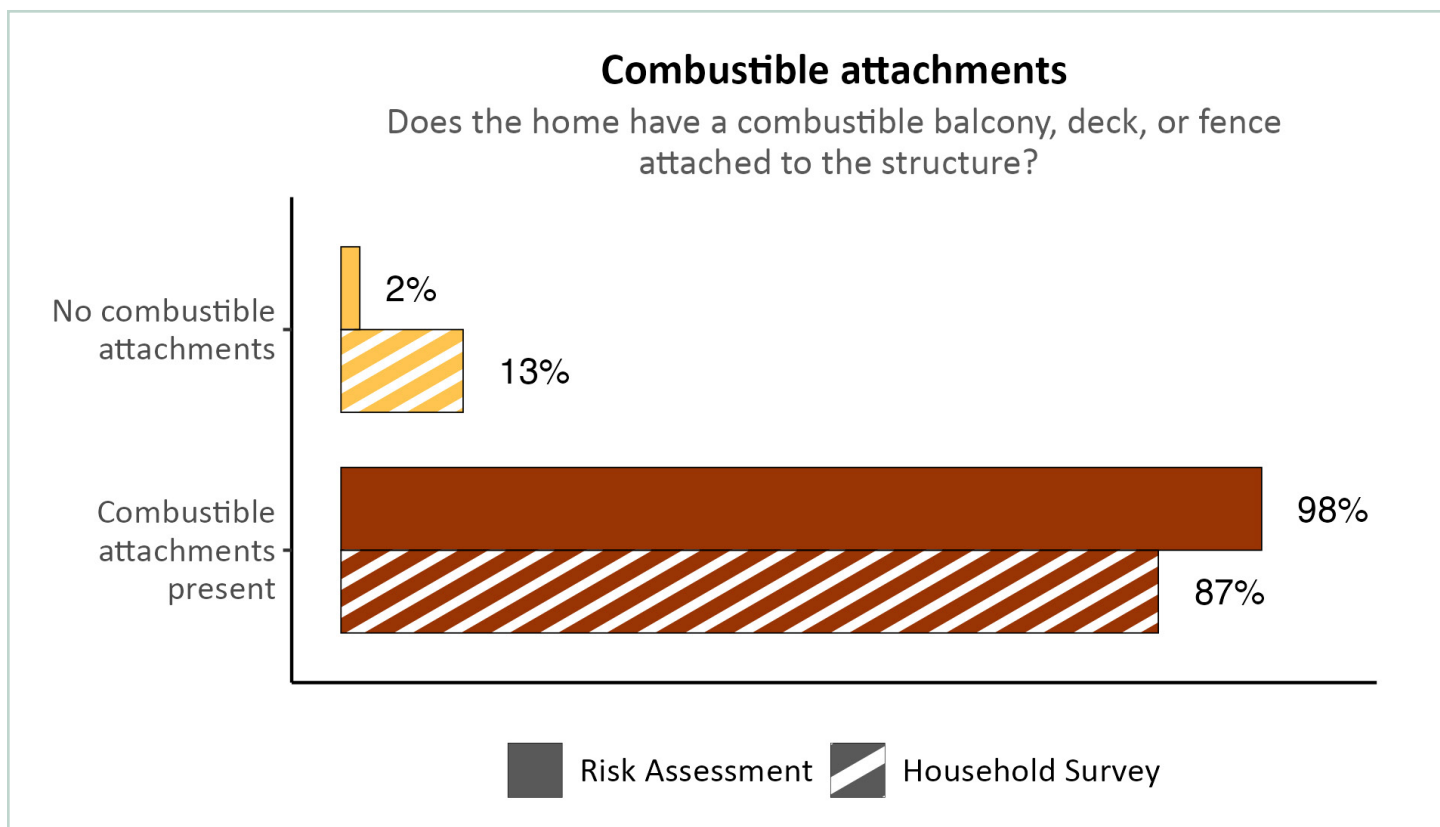


Figure 7—Presence or absence of combustible attachments. Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment data. N = 120

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 can ignite due to radiant heat. Homes located in close proximity 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 neighboring homes.

The WiRē RA and household survey data report that most homes (73% and 70%, respectively) were more than 100 feet from another home. According to WiRē RA data, 19 percent of homes were 30 to 100 feet away from other homes, while 27 percent of survey respondents reported a similar spacing. WiRē RA data reported that 8 percent of homes were less than 10 feet from a neighboring home, but zero (0) percent of survey respondents reported the same. Refer to figure 8.

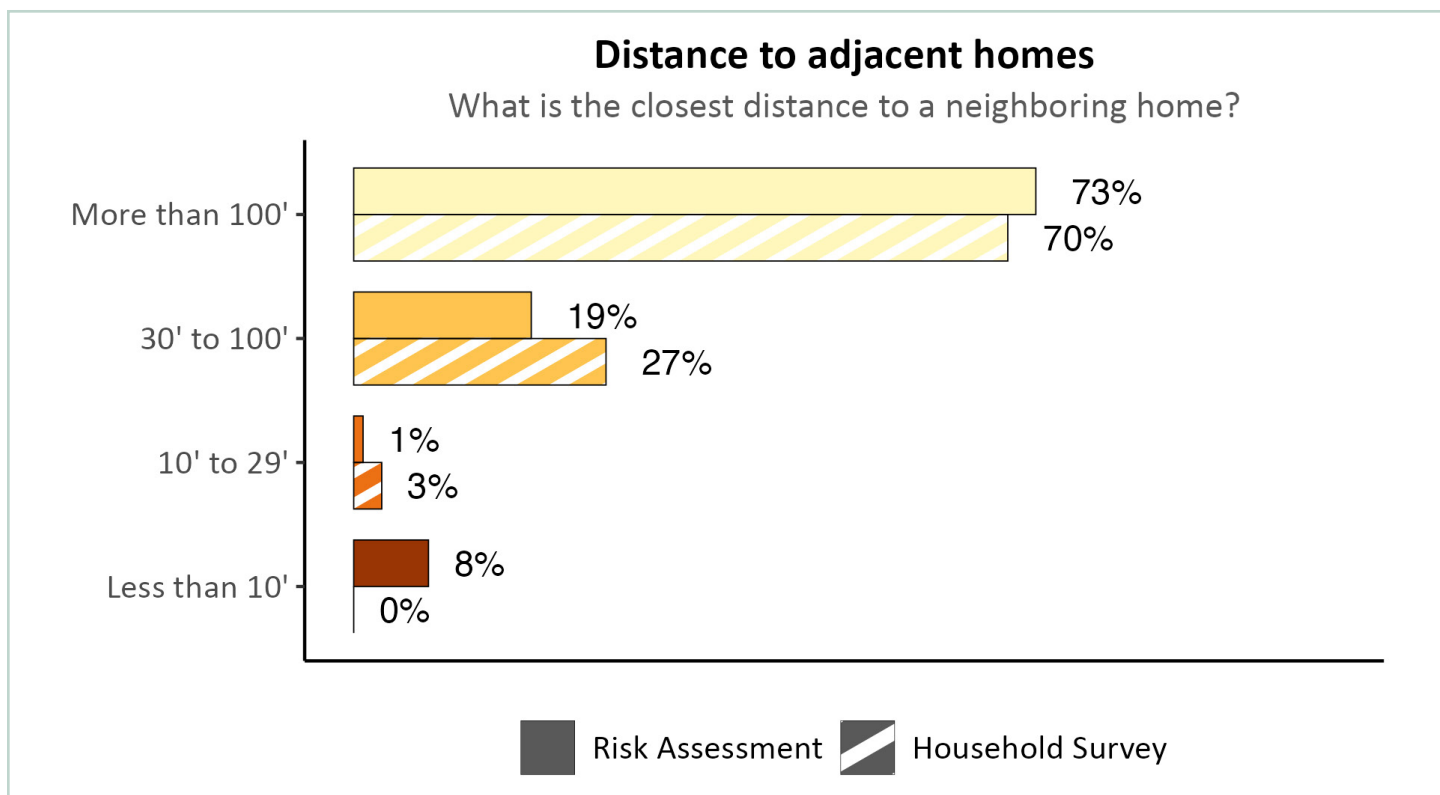


Figure 8—Proximity to adjacent homes, categorized by closest distance to neighboring home. Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment data. N = 120

Defensible space—

Home ignition is affected by the presence of, or direct contact with, vegetation and other combustible materials which can ignite and transfer heat 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. Almost one-half (47%) of the properties had less than 5 feet between the house and overgrown vegetation according to WiRē RA data, and 1 percent of survey respondents saw this to be the case. Many survey respondents (45%) reported having 30 to 100 feet between their home and overgrown vegetation, while 12 percent of homes fell into this category according to trained assessors. Refer to figure 9.

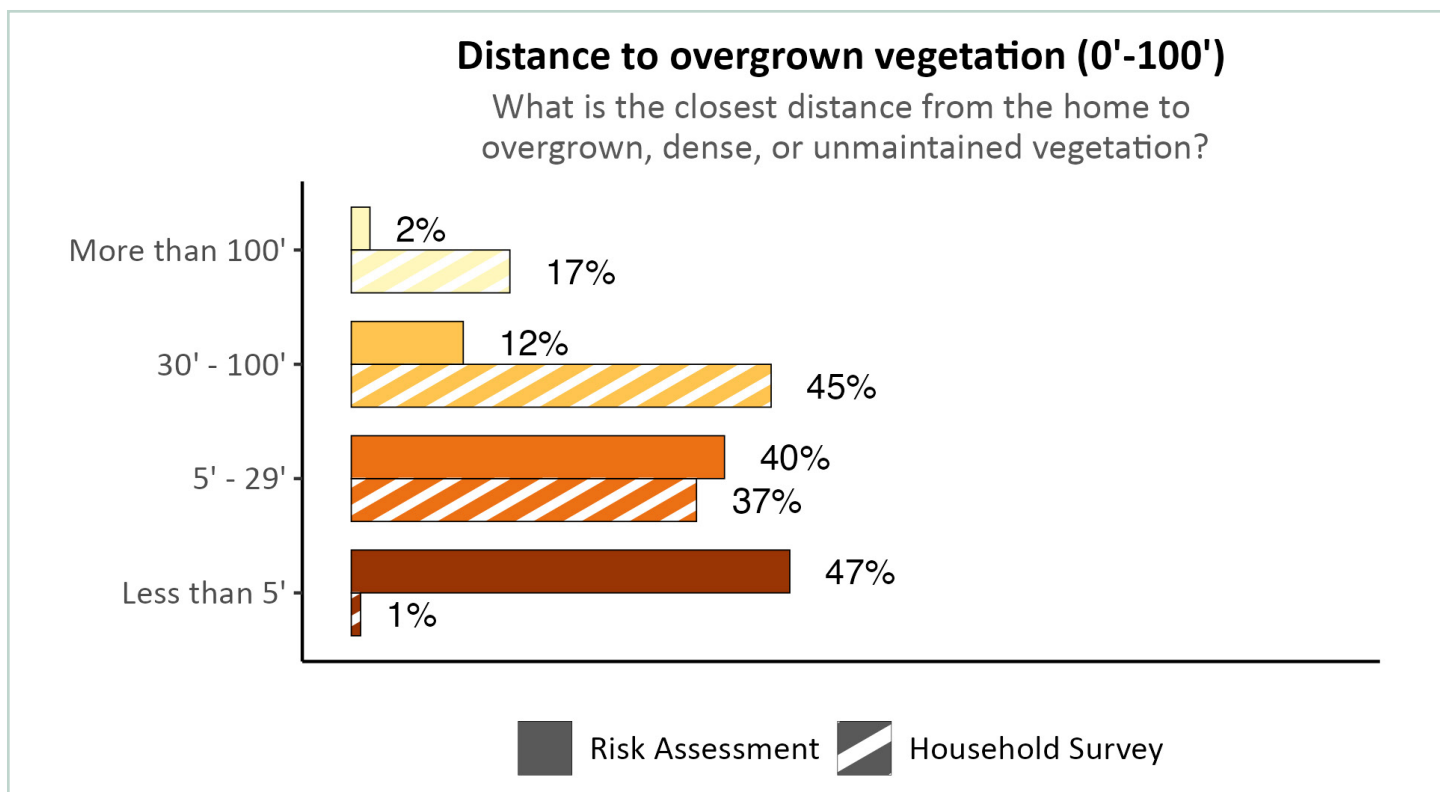


Figure 9—Distance to overgrown vegetation, categorized by distance between the home and overgrown, dense, or unmaintained vegetation. Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment data. N = 121

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, hay bales, propane tanks, storage sheds, and other flammable materials.

The survey responses and WiRē RA data did not align on this attribute. Trained assessors reported that 71 percent of homes had less than 5 feet to the nearest combustible item, while more than one-half of the survey respondents (58%) reported having 5 to 30 feet between their homes and non-vegetative combustible items. Additionally, 27 percent of survey respondents reported having more than 30 feet of distance, but trained assessors observed 4 percent of homes in this category. Refer to figure 10.

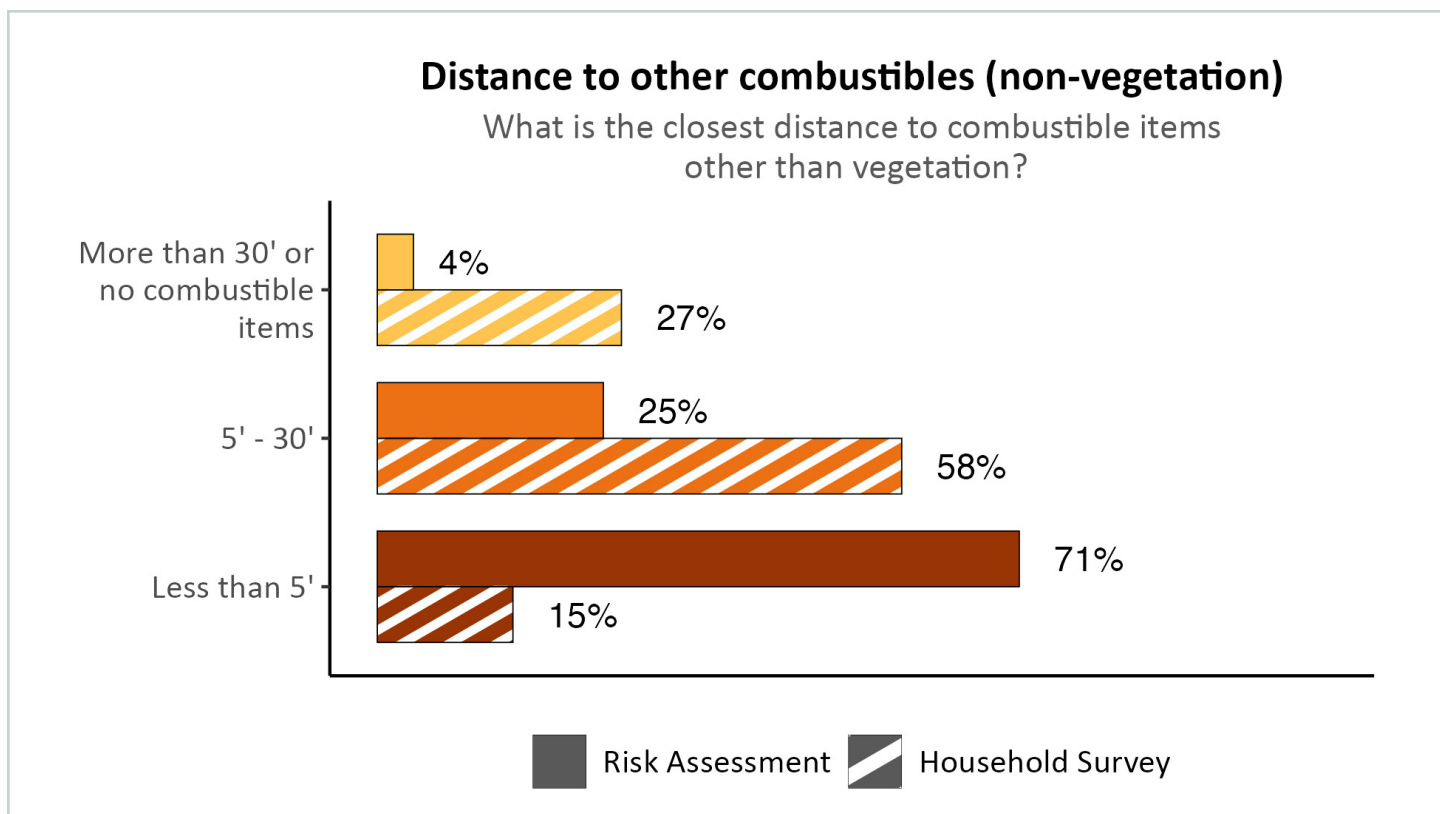


Figure 10—Distance to other combustible materials, categorized by closest distance from home to combustible items other than vegetation. Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment data. N = 120

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, overall slope of the property, and the type and density of surrounding vegetation. These are further described below.

Risk attribute: distance to dangerous topography—

Wildfire behavior is influenced by topography. Features that can facilitate increased fire behavior (rate of spread, intensity, etc.) such as drainages, narrow canyons, and chimneys are considered when assessing topography. Properties are 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.

Trained assessors and survey respondents were aligned in their understanding of proximity to dangerous topography. WiRē RA and household survey data both reported a majority of homes (81% and 78%, respectively) as being more than 150 feet away from dangerous topography. Three percent of homes fall into the category of less than 50 feet from dangerous topography according to WiRē RA data, while household survey data reported 8 percent of homes fall into this category. Refer to figure 11.

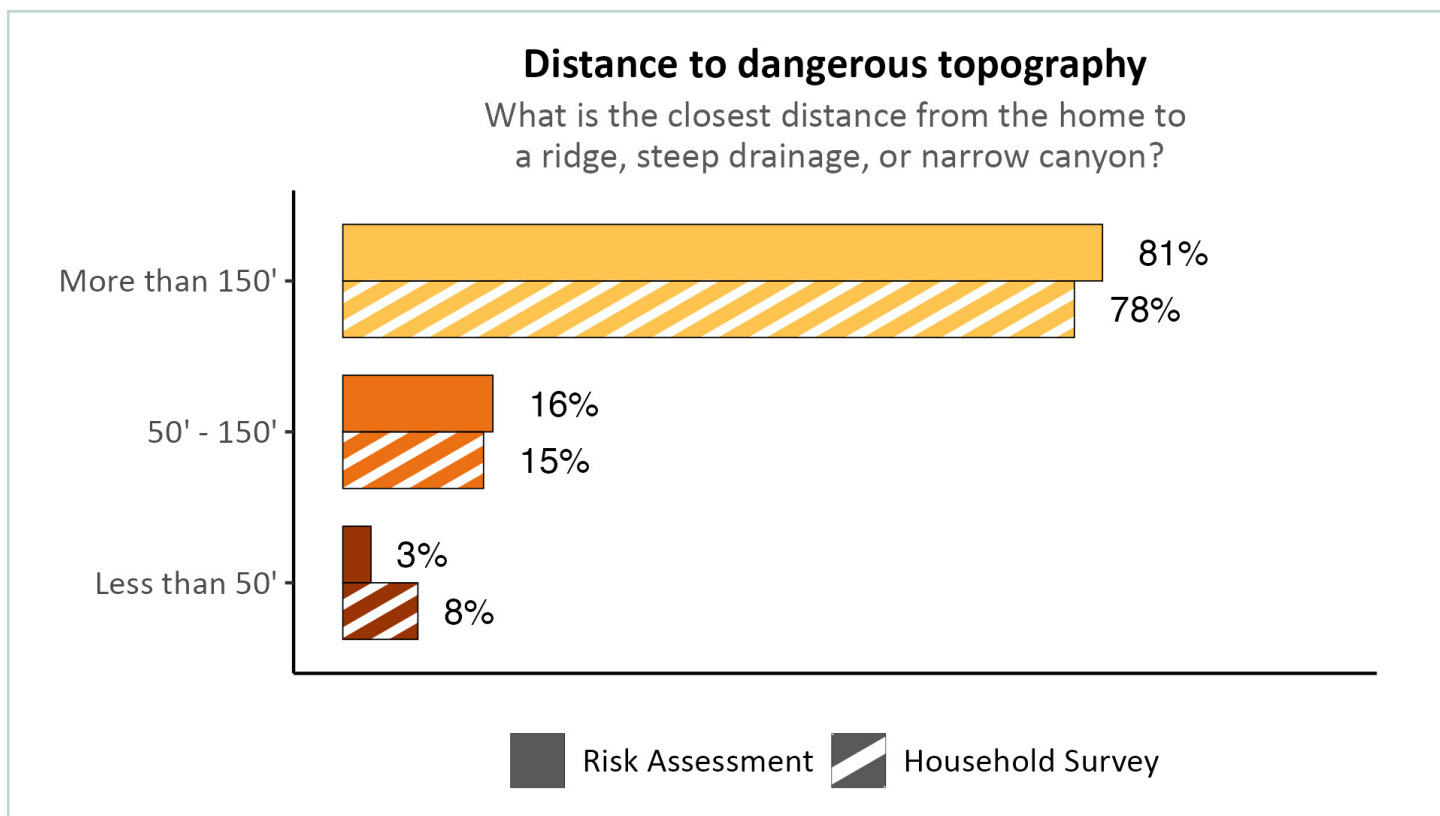


Figure 11—Closest distance from the home to dangerous topography (e.g., a ridge, steep drainage, or narrow canyon). Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment data. N = 120

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.

The survey responses and WiRē RA data align on this attribute. Many survey respondents (47%) reported that the land within 150 feet of their homes had a moderate slope of 20 percent to 45 percent, while another 43 percent described it as gentle, with a slope of less than 20 percent. Trained assessors classified 42 percent of the properties as having a moderate slope and 45 percent of the properties as having a gentle slope. Refer to figure 12.

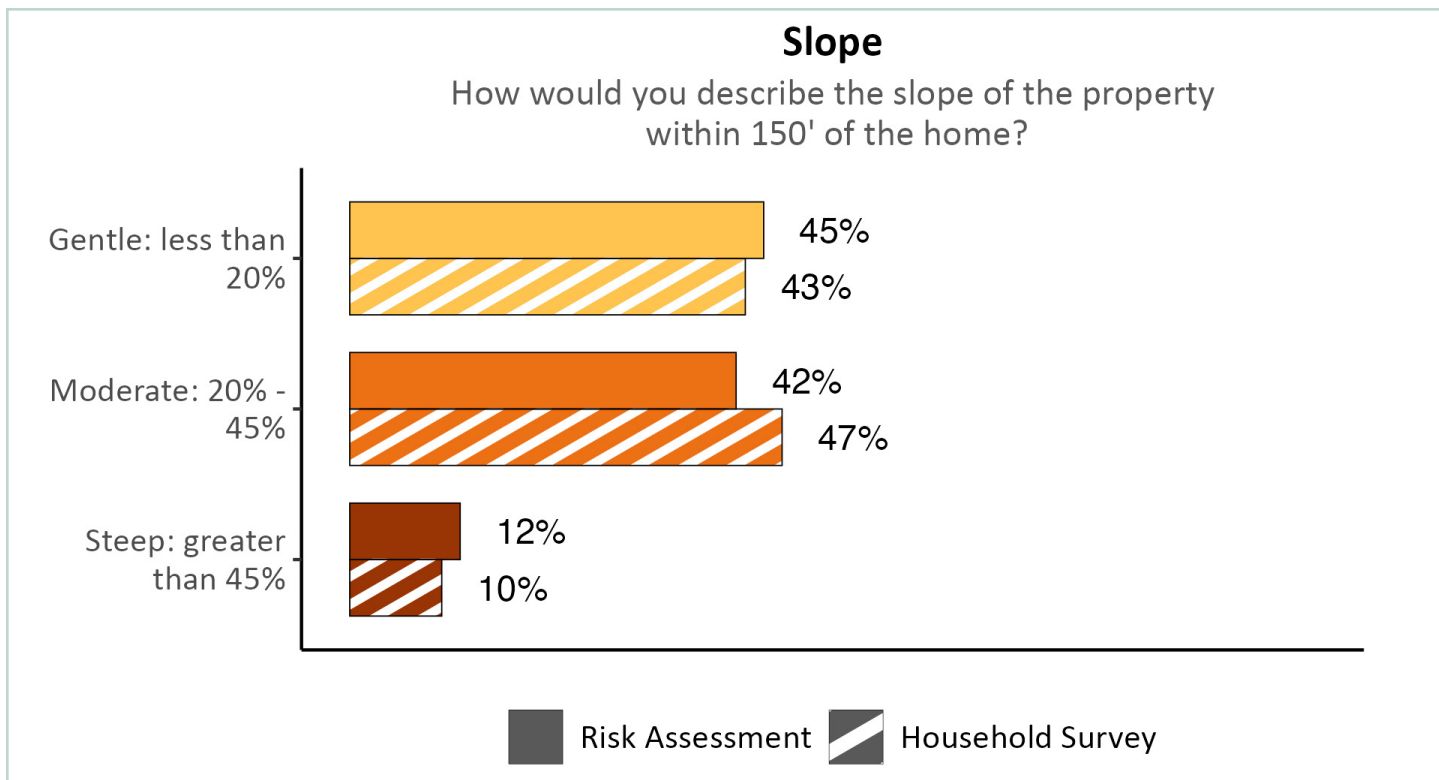


Figure 12—Slope of property. Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment data. N = 121

Risk attribute: adjacent fuels—

Vegetation surrounding the home beyond the defensible space zone is another factor in determining wildfire behavior. Properties are 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. The household survey provided six descriptions of vegetation that were collapsed into three categories: light, medium, and dense. Light was for properties with grasses less than one-foot, dead material, or those with isolated shrubs or trees. Medium included properties with wooded areas with only hardwood trees and no small trees or shrubs or tall dead grasses, or those with mixed hardwood and spruce, no small trees or shrubs, and tall dead grasses underneath. Dense was for properties surrounded by mixed wooded areas with hardwood and spruce trees, lots of small trees and shrubs, and tall dead grasses underneath, or those with dense spruce forest.

This attribute revealed a disconnect around the classification of adjacent fuels. According to the WiRē RA data, nearly all properties (93%) had dense fuels between 100 and 150 feet from the home, while over half (58%) of survey respondents reported the same. Additionally, 38 percent of survey respondents reported medium fuels within this range, but the RA data reported 7 percent of properties had medium adjacent fuels. Refer to figure 13.

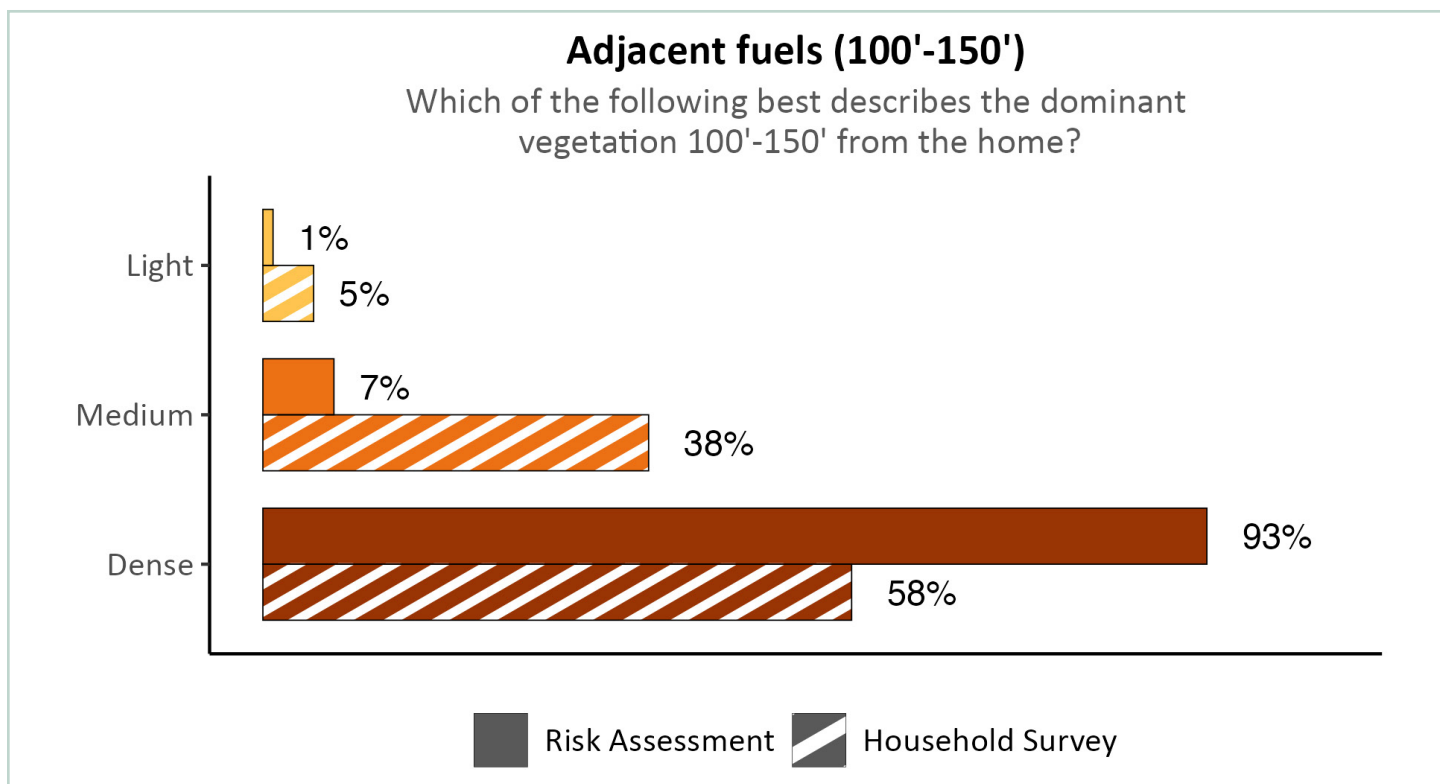


Figure 13—Adjacent fuels, categorized by the density of dominant vegetation 100 to 150 feet from the home. Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment data. N = 120

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 are assessed based on local addressing standards of signage that are posted and visible from the primary road. Local standards for property address postings: posted address was visible from the road, reflective, displayed 3-inch numerals on a contrasting background (white letters on a green background), and ensured the materials were durable.

The RA data and survey responses did not completely align on this attribute. While 43 percent of survey respondents reported address postings that met all local standards, trained assessors reported that 21 percent of the properties met these local address standards. Additionally, WiRē RA data reported that 27 percent of properties did not have address postings or they were not visible, compared to 19 percent as reported by survey respondents. Refer to figure 14.

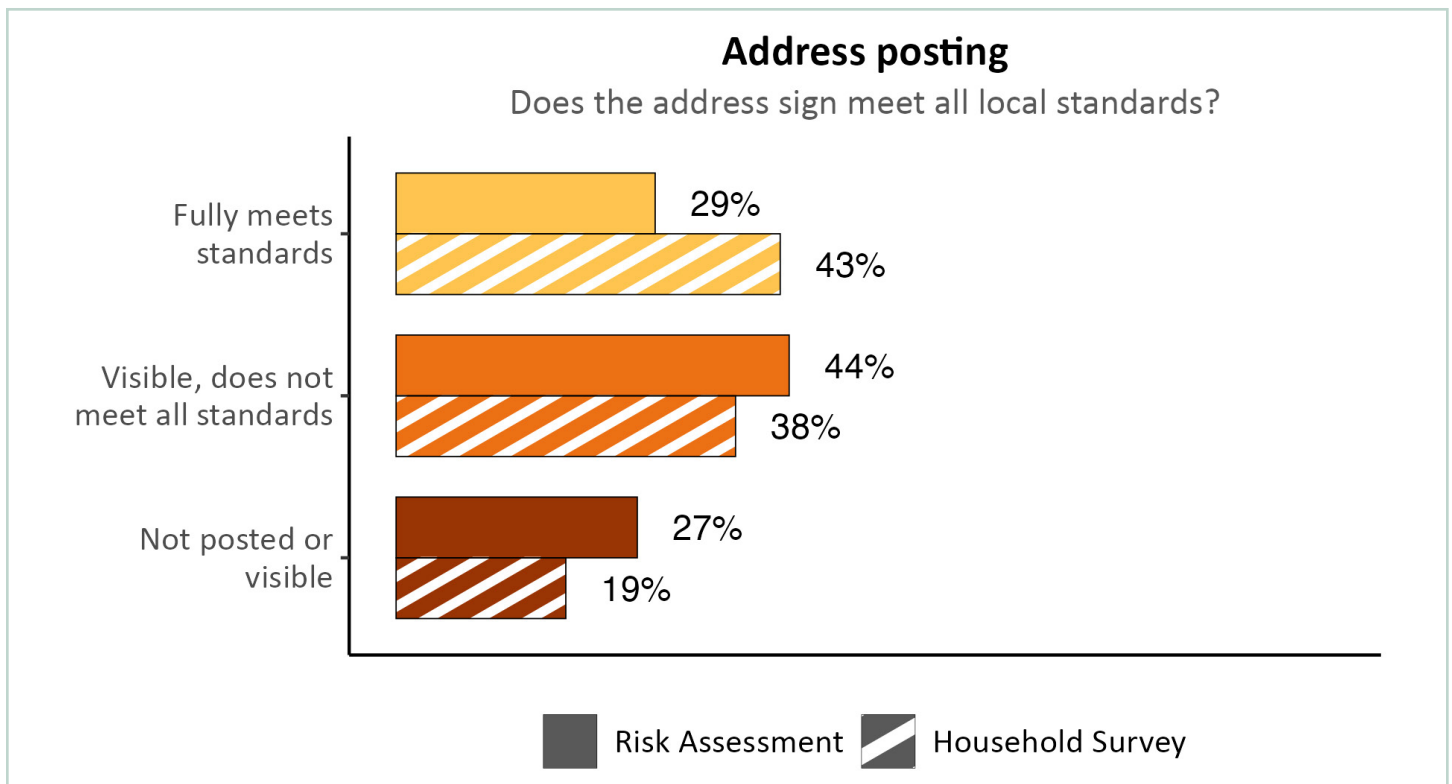


Figure 14—Characteristics of property address. Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment data. N = 119

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.

WiRē RA data and survey data were aligned on this attribute. Both trained assessors and survey respondents reported that most properties (both 90%) had only one road in and out of the community. Refer to figure 15.

Ingress/egress

If the road to access the home was blocked due to a wildfire, is there another road to get out of the community?

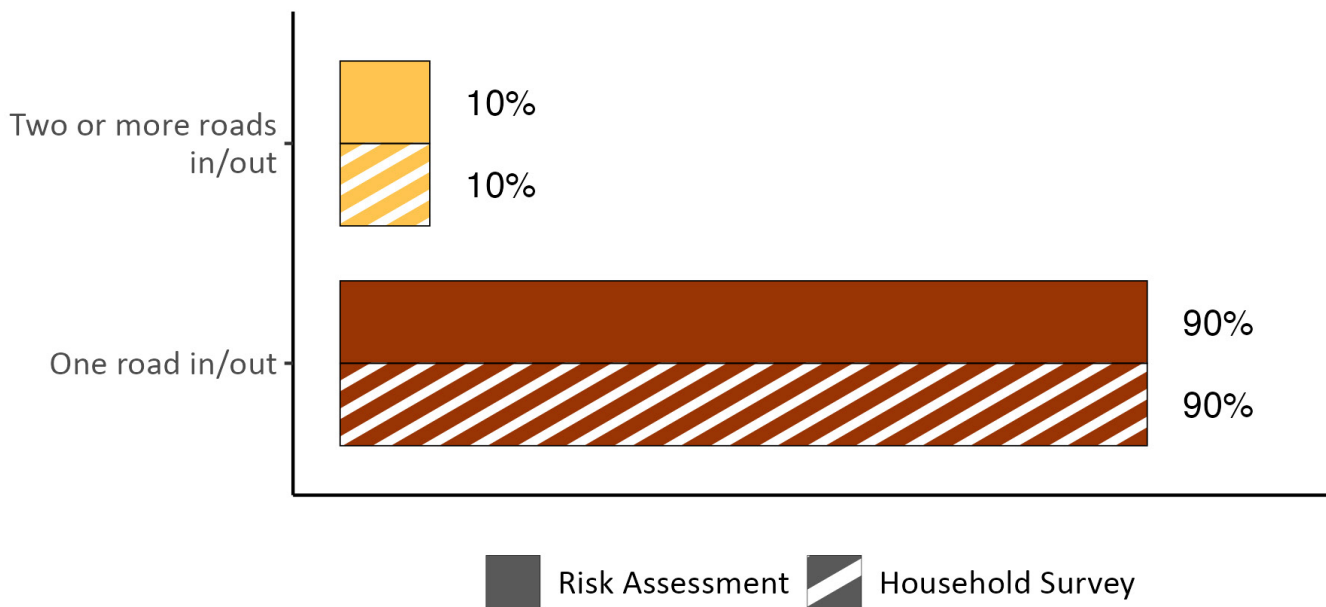


Figure 15—Number of evacuation routes in or out of community. Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment data. N = 119

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, 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 local clearance standards, the driveway must be at least 13.5 feet in height and 20 feet in width.

The WiRē RA data and household survey data showed discrepancies regarding this attribute. Survey responses reported that most driveways (58%) met one, but not both, standards. Additionally, over one-quarter (28%) of driveways were reported to meet both standards, while 14 percent of driveways were reported to not meet either standard according to survey respondents. In contrast, the WiRē RA data reported 30 percent of driveways did not meet either standard and 44 percent met one standard. Refer to figure 16.

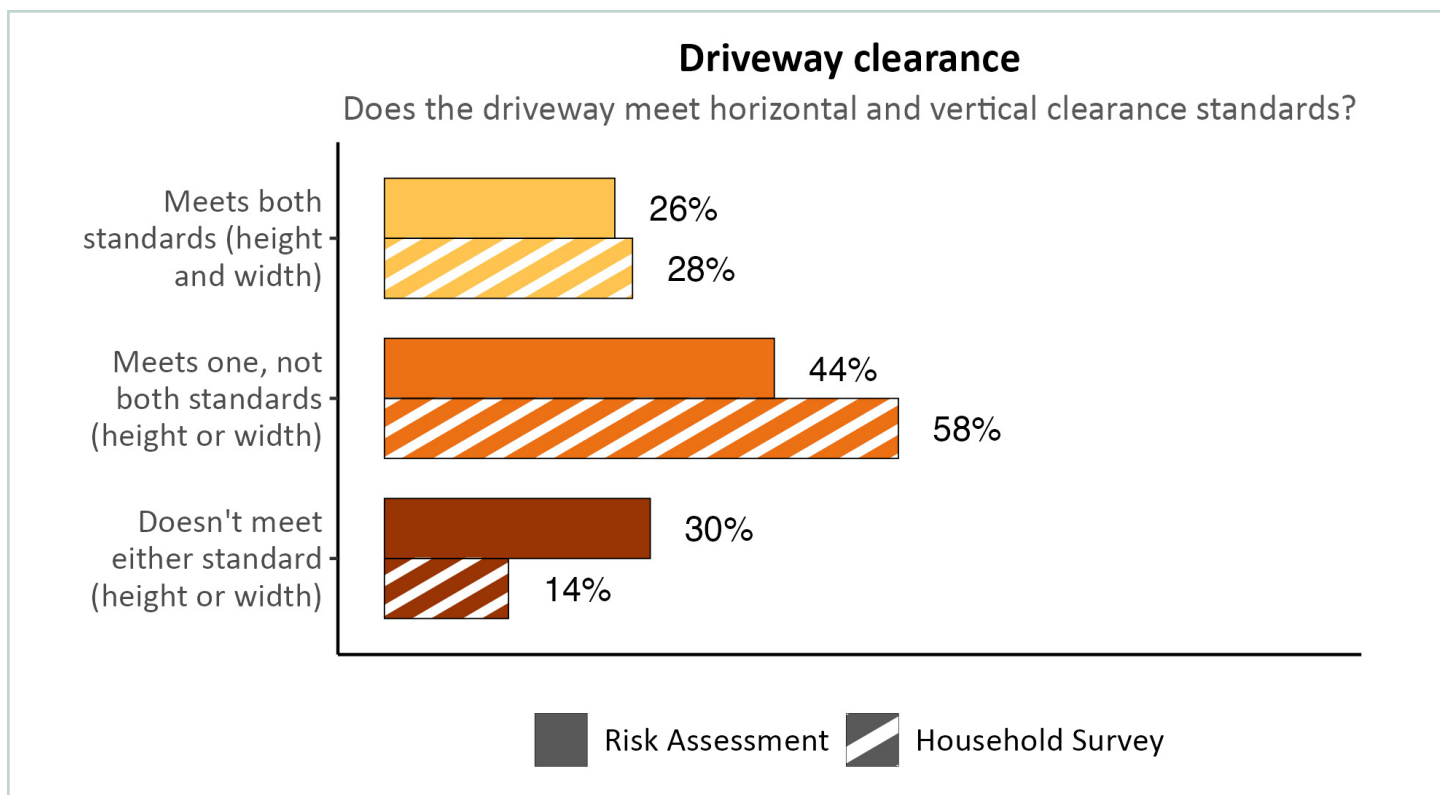


Figure 16—Width of residence driveway at its narrowest point. Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRē) parcel-level rapid wildfire risk assessment data. N = 109

Risk attribute: driveway length—

Similar to driveway clearance, the length of a driveway and its turnaround space also affects the ability of fire engines to safely respond to wildfire. The WiRē RA distinguishes between properties with driveways that are shorter than 150 feet, driveways that are longer than 150 feet but with a turnaround suitable for a Type 1 engine, and driveways longer than 150 feet without adequate turnaround space.

The WiRē RA and household survey data both reported the largest proportion (53% and 46% respectively) of driveways were less than 150 feet long. However, beyond this point, the WiRē RA data and survey respondent data diverge. Trained assessors reported 10 percent of all the driveways assessed as 150 feet or longer with adequate turnaround space and reported that over one-third (38%) were 150 feet or longer without adequate turnaround space. In contrast, survey respondents reported 35 percent of the driveways as 150 feet or longer with adequate turnaround space. Refer to figure 17.

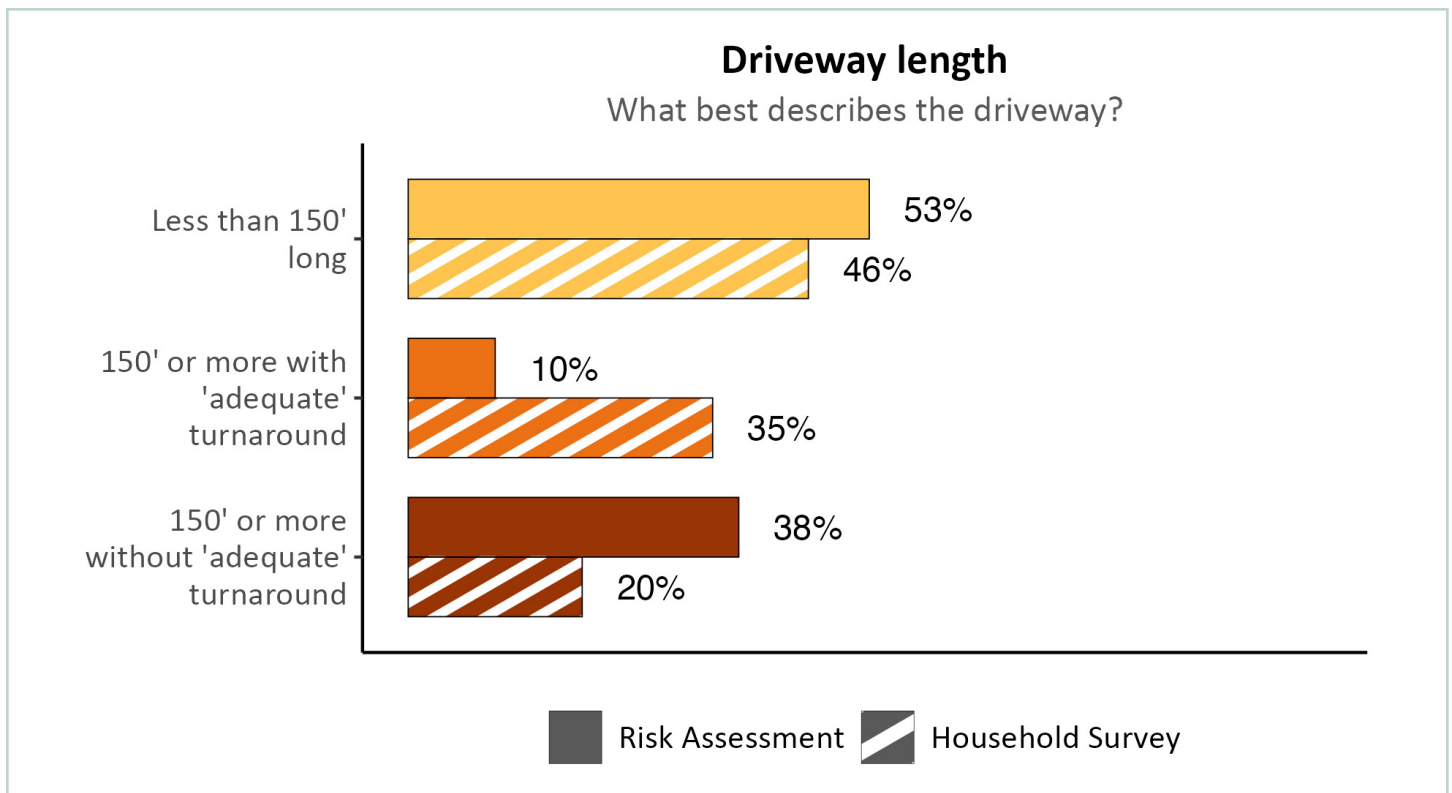


Figure 17—Driveway length and presence of turnaround. Comparison of household survey data as reported in 2024 by survey respondents in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area and paired Wildfire Research (WiRe) parcel-level rapid wildfire risk assessment data. N = 112

Social Dimensions of Wildfire Risk in Cooper Landing: 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).

Demographics

Most survey respondents (53%) reported occupying their homes in Cooper Landing year-round, and an additional 46 percent of owners spend at least some time at their Cooper Landing residence within a year. The average year of construction of the homes in the study area was 1986, and the average year that the survey respondents moved into their homes was 2002. At the time of purchasing or beginning to rent their homes in Cooper Landing, 44 percent of survey respondents reported being very aware of the wildfire risk, 42 percent reported being somewhat aware, and 11 percent reported being unaware of the wildfire risk (refer to fig. 18).

Survey respondents were more likely to identify as male (76%) and the average age of survey respondents was 66 years old. Seventy-nine percent of survey respondents reported holding a bachelor's degree or higher, and of those, 43 percent held an advanced degree (e.g., M.D., M.A., M.S., PhD). Fifty-six percent of survey respondents were retired, 33 percent worked full-time, 11 percent worked part-time, and 1 percent were unemployed. Sixty-eight percent of survey

respondents reported annual household incomes of \$100,000 or greater, 25 percent reported \$50,000 to \$99,999, and 7 percent reported annual household incomes of less than \$50,000.

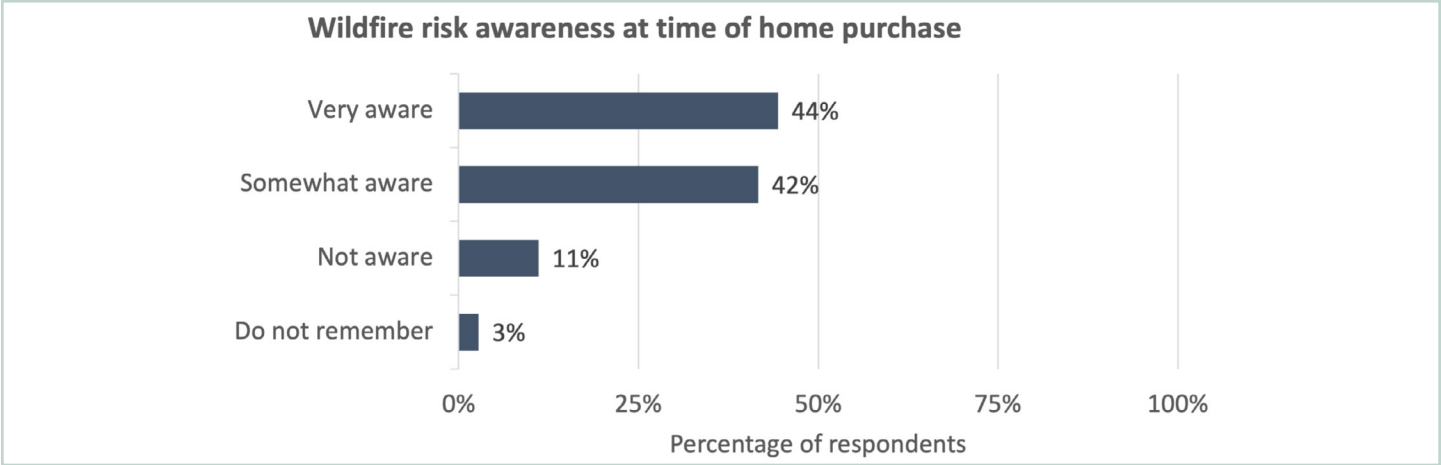


Figure 18—Respondents’ awareness of wildfire risk when they bought or began renting their home, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 144 respondents to this survey question.

Wildfire Experience and Risk Perceptions

Wildfire experience—

Around one-third of survey respondents (36%) had evacuated due to wildfire in the past. Five percent of survey respondents reported having experienced smoke damage, while almost none of the survey respondents reported experiencing fire damage (1%) or destruction of their residences due to wildfire (refer to fig. 19).

While few survey respondents (3%) reported wildfire on their properties, 24 percent reported that a wildfire had come within 2 miles, and 57 percent reported a wildfire within 10 miles of their properties. The rest (16%) reported that past wildfires had either been more than 10 miles from their home or they were not sure (refer to fig. 20).

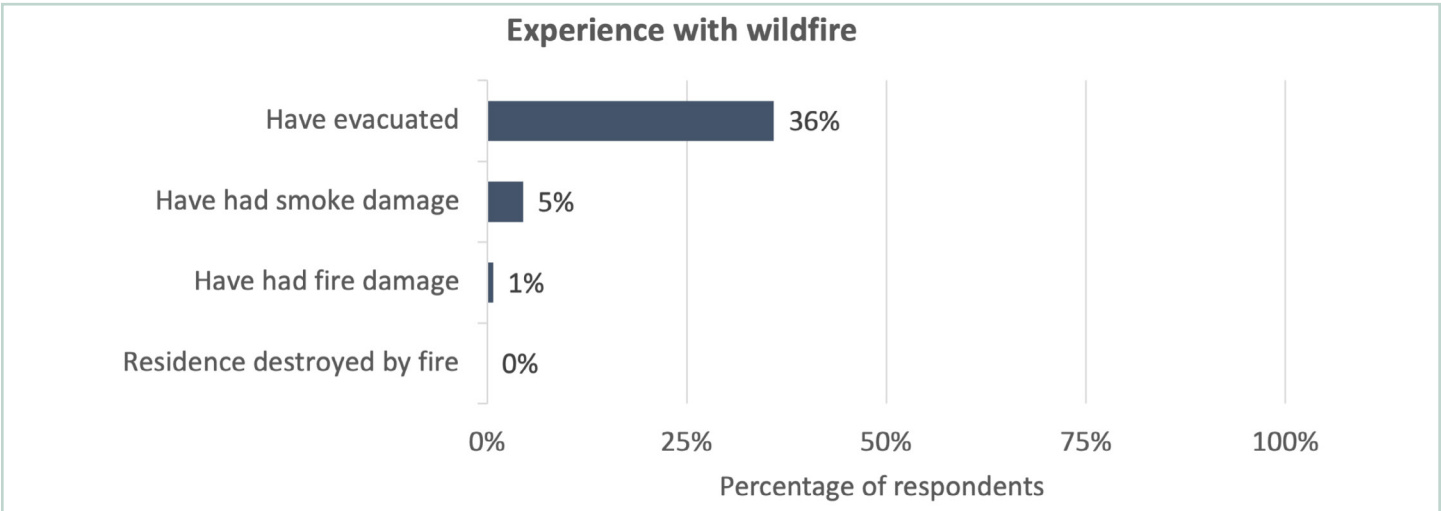


Figure 19—Respondent experience with various impacts of wildfire, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 133–142 respondents to these survey questions.

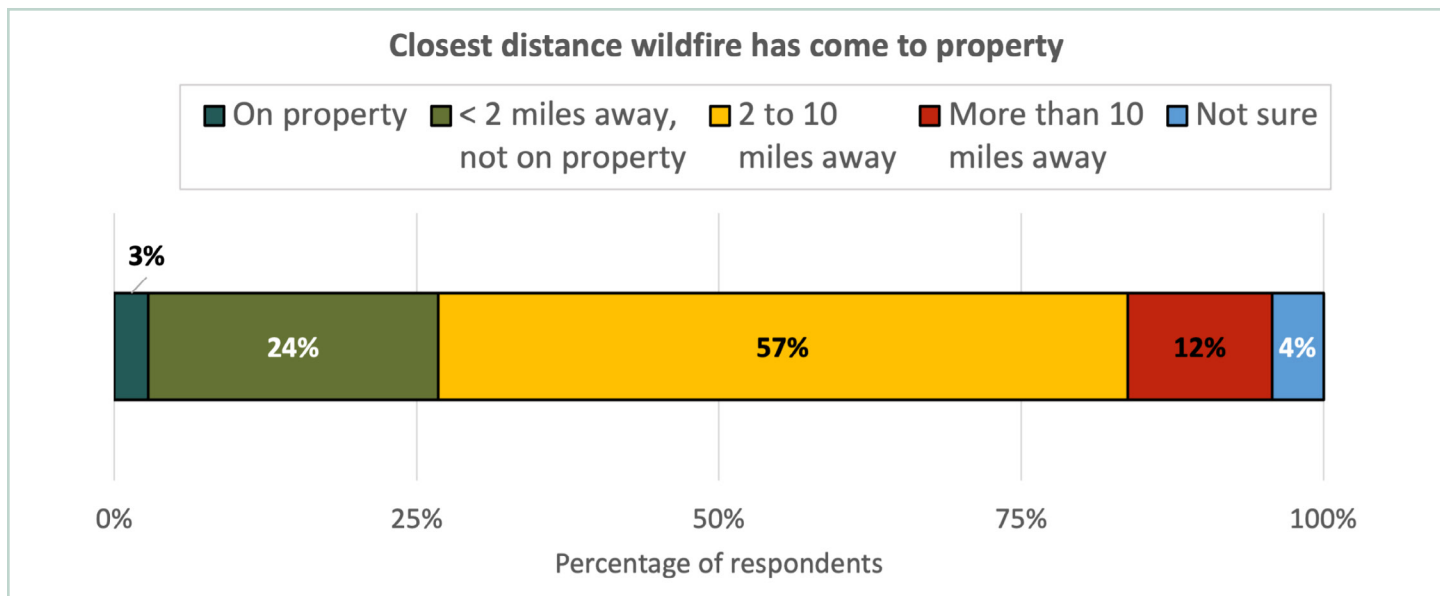


Figure 20—Respondent estimates of how close a wildfire has come to their property, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 142 respondents to this survey question.

Perceptions of risk—

Survey respondents were asked to consider the likelihood of the occurrence of wildfire on their properties and potential outcomes in that event. Seventy-five percent agreed or strongly agreed with the statement, “My property is at risk of wildfire.” However, 1 percent of 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).

Despite survey respondents reporting that their properties were at risk of wildfire, 19 percent of respondents reported an expectation of a 50 percent or greater chance of wildfire on their properties in the next year. Fifty percent of survey respondents thought it likely there would be severe damage or destruction of their home if there was wildfire on their property (refer to fig. 22).

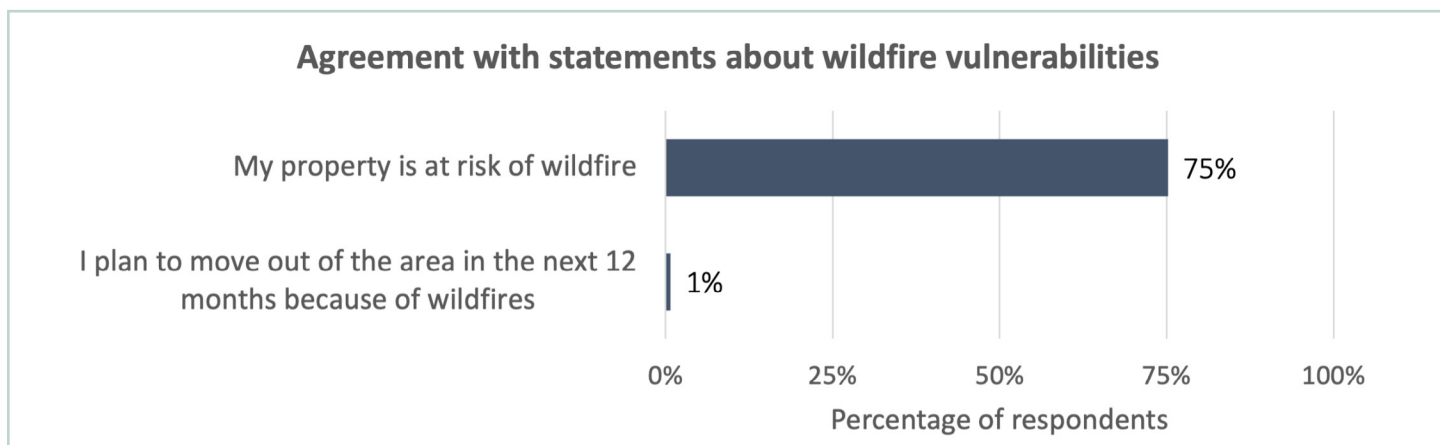


Figure 21—Agreement (“agree” or “strongly agree”) with statements about whether wildfire threatens the respondent’s property and water supply, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 139–141 respondents to each survey statement listed.

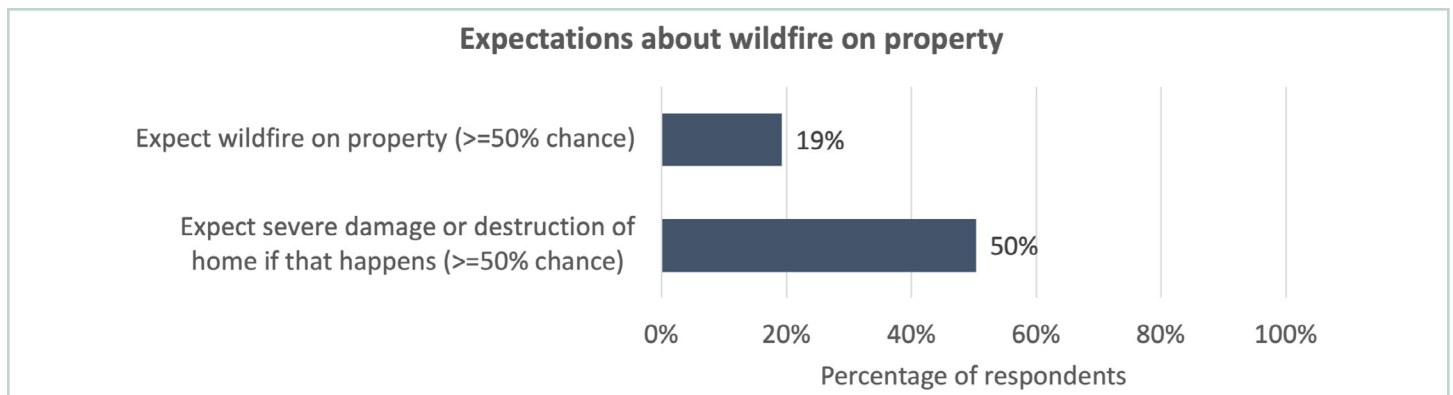


Figure 22—Estimate of the chances (>50% chance) of a wildfire on property in the next year, and chances (>50% chance) of losing home in that case, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 140 and 141 respondents to the two survey statements listed, respectively.

When asked who would protect their homes in the event of a wildfire, 13 percent of the survey respondents thought it was very or extremely likely that the fire department would save their homes. Additionally, 13 percent thought it was very or extremely likely that they would be able to put out the fire themselves (refer to fig. 23).

Regarding potential outcomes, 65 percent of respondents reported that, in the event of a wildfire on their properties, it was very or extremely likely that their trees and landscapes would burn. In contrast, 44 percent believed it was very or extremely likely their homes would sustain smoke damage or physical damage. Forty-three percent believed it was very or extremely likely that their neighbors’ homes would be damaged or destroyed, while fewer thought their own homes would be destroyed (25%) or that they would lose money due to loss of business or income (21%) (refer to fig. 24).

Few survey respondents indicated it was very or extremely likely that their home would be ignited by direct flame (38%), embers (24%), or nearby homes (16%) if there was a wildfire on their property (refer to fig. 25).

Most respondents identified various factors as major contributors to wildfire risk. Nearly all (90%) believed that vegetation on their neighbors’ properties contributed somewhat or a lot to the risk of a wildfire damaging their own residence. Most survey respondents indicated that they believed vegetation on nearby public or undeveloped land (88%), vegetation on their own property (86%), or the physical characteristics of their own residence or other buildings on their property (73%) would contribute somewhat or a lot to the risk of property damage from a wildfire. Additionally, nearly two-thirds (63%) believed that the lack of water supply to suppress fires would be a contributing factor to the risk of wildfire damaging their property (refer to fig. 26).

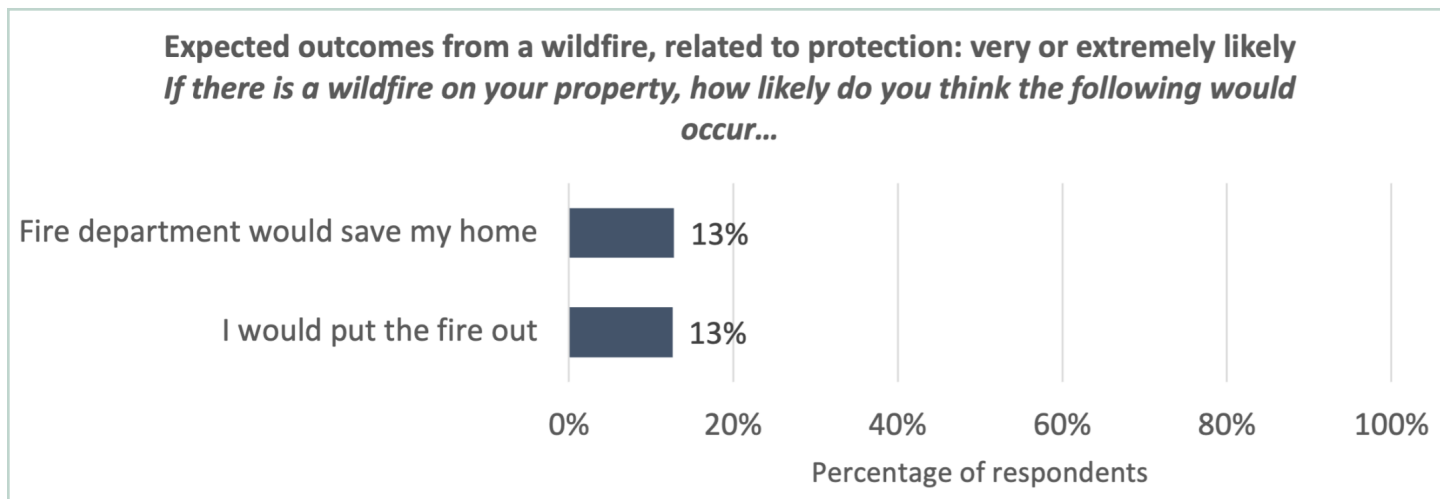


Figure 23—Percentage of respondents who thought the above source of protection to their home were very or extremely likely, in the event of a wildfire on their property, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 141–143 respondents to each survey statement listed.

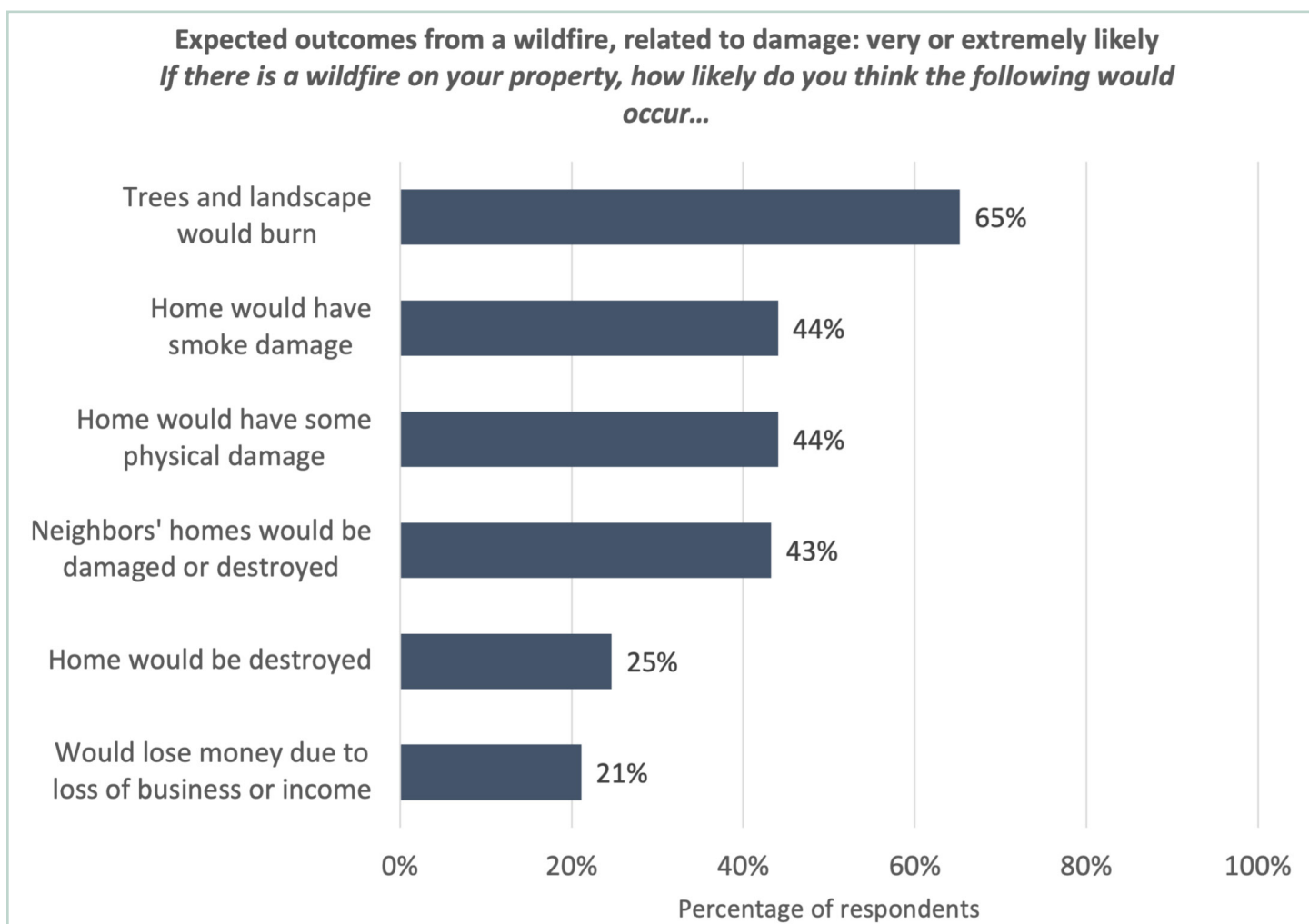


Figure 24—Percentage of respondents who thought the above forms of wildfire damage were very or extremely likely in the event of a wildfire on their property, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 141–144 respondents to each survey statement listed.

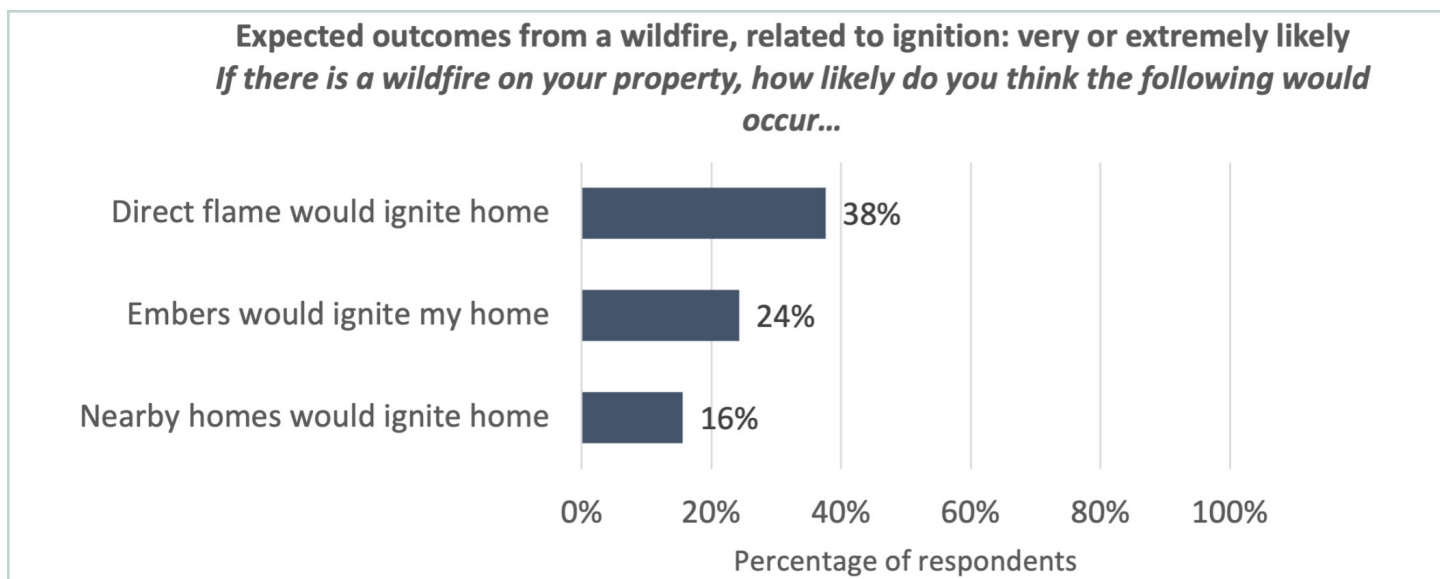


Figure 25—Percentage of respondents who thought the above sources of ignition were very or extremely likely, in the event of a wildfire on their property, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 140–141 respondents to each survey statement listed.

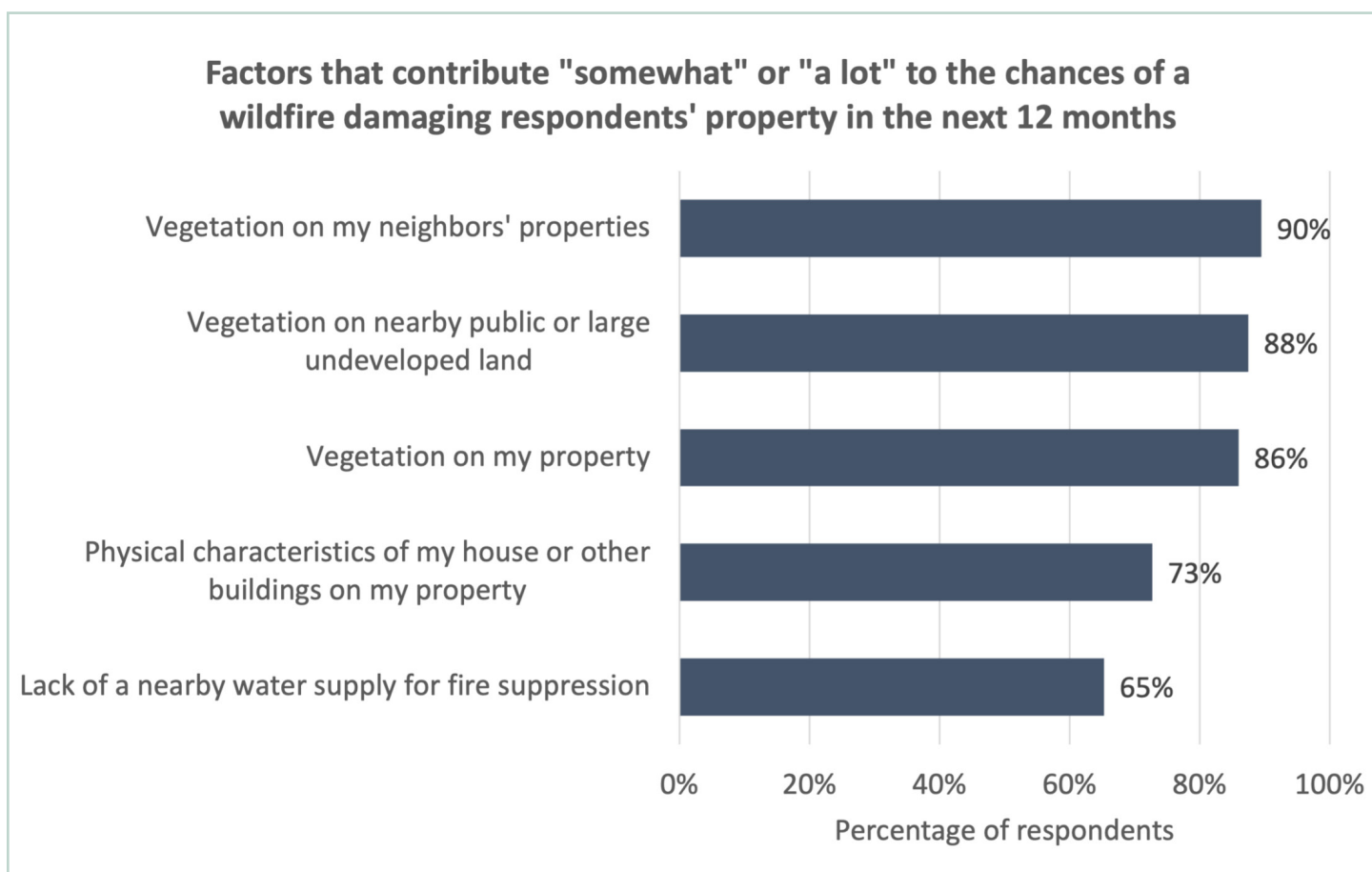


Figure 26—Percentage of respondents who thought the above factors contribute “a lot” to the chances of a wildfire damaging their property in the next 12 months, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 143–144 respondents to 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—

Almost three-quarters (74%) of survey respondents reported talking to their neighbors about wildfire (refer to fig. 27). These interactions can help spread information about localized wildfire risk.

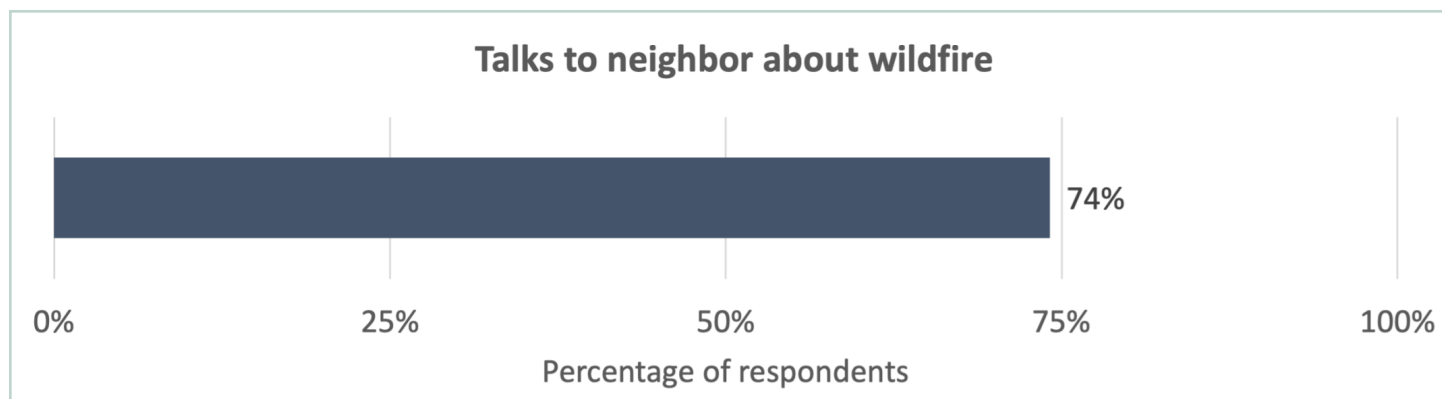


Figure 27—Percentage of respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska, who reported talking to their neighbor about wildfire, as reported in 2024. N = 143 respondents to this survey question.

Most survey respondents (90%) reported having homeowners' insurance, yet less than two-thirds (65%) thought their home was adequately insured. Further interaction with insurance agencies has the potential to influence homeowners' knowledge and perceptions of wildfire risk and motivate mitigation activities. Among respondents, 16 percent reported paying a higher premium due to their wildfire risk, 16 percent were required by their insurance company to take action to reduce their risk, 10 percent were refused insurance due to wildfire risk, and 4 percent were provided a discount for mitigating wildfire risk. Refer to figure 28.

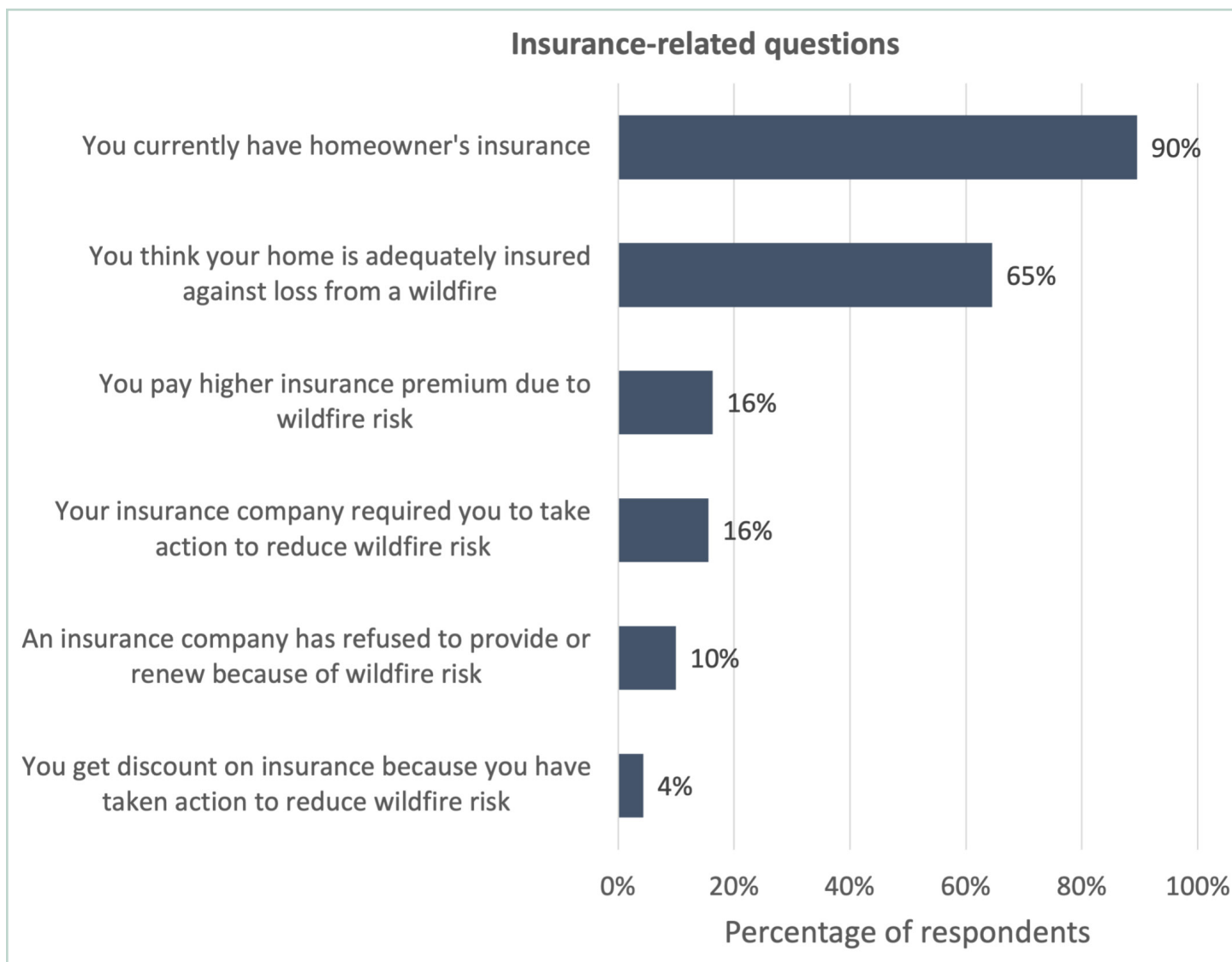


Figure 28—Respondents’ knowledge of and experience with various insurance company actions, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 139–141 respondents to each statement.

Sources of information and reported usefulness—

Survey respondents were asked whether they had received wildfire risk information from various sources and to evaluate the usefulness of each source they had received. The CLES and Kenai Peninsula Borough Ready-Set-Go! program reached the most respondents (71% and 67%, respectively) and were found to be very or extremely useful by many of them (59% and 58%, respectively). While the media was the third most received source by respondents (65%), 30 percent of those who used this source found it very or extremely useful. Other sources that reached many respondents included the Alaska Firewise (65%), the Office of Emergency Management (59%), and local tree contractors (56%). Refer to figure 29.

Notably, 21 percent of survey respondents indicated that they knew the number to reach the Office of Emergency Management call center, a resource with up-to-date local emergency information.

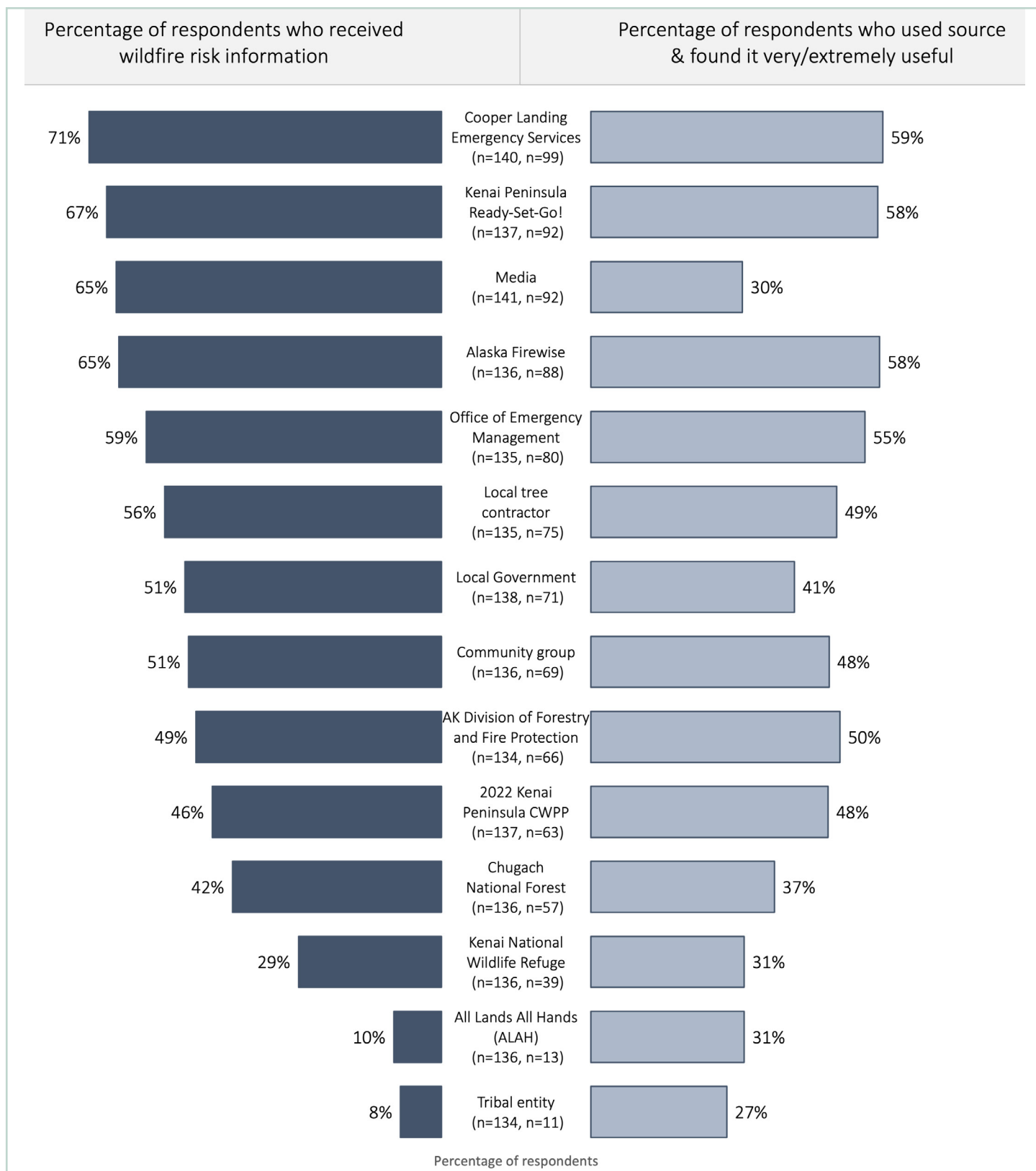


Figure 29—Percentage of respondents who received wildfire risk information, by source, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. This data is compared to the percentage of people who said they found each source's wildfire risk information very or extremely useful (percentage of all respondents who received wildfire risk information from that particular source). N = 134–140 respondents to source receipt questions; N = 11–99 respondents to source usefulness questions. CWPP = Community Wildfire Protection Plan.

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 43 percent of respondents. The top channels through which survey respondents received information were internet (non-social media) (43%), email/e-newsletter (41%), community meetings (38%), and TV news (33%). The most preferred channels were email/e-newsletter (43%), conversations with a local wildfire specialist (33%), and mailed newsletters (32%). Refer to figure 30.

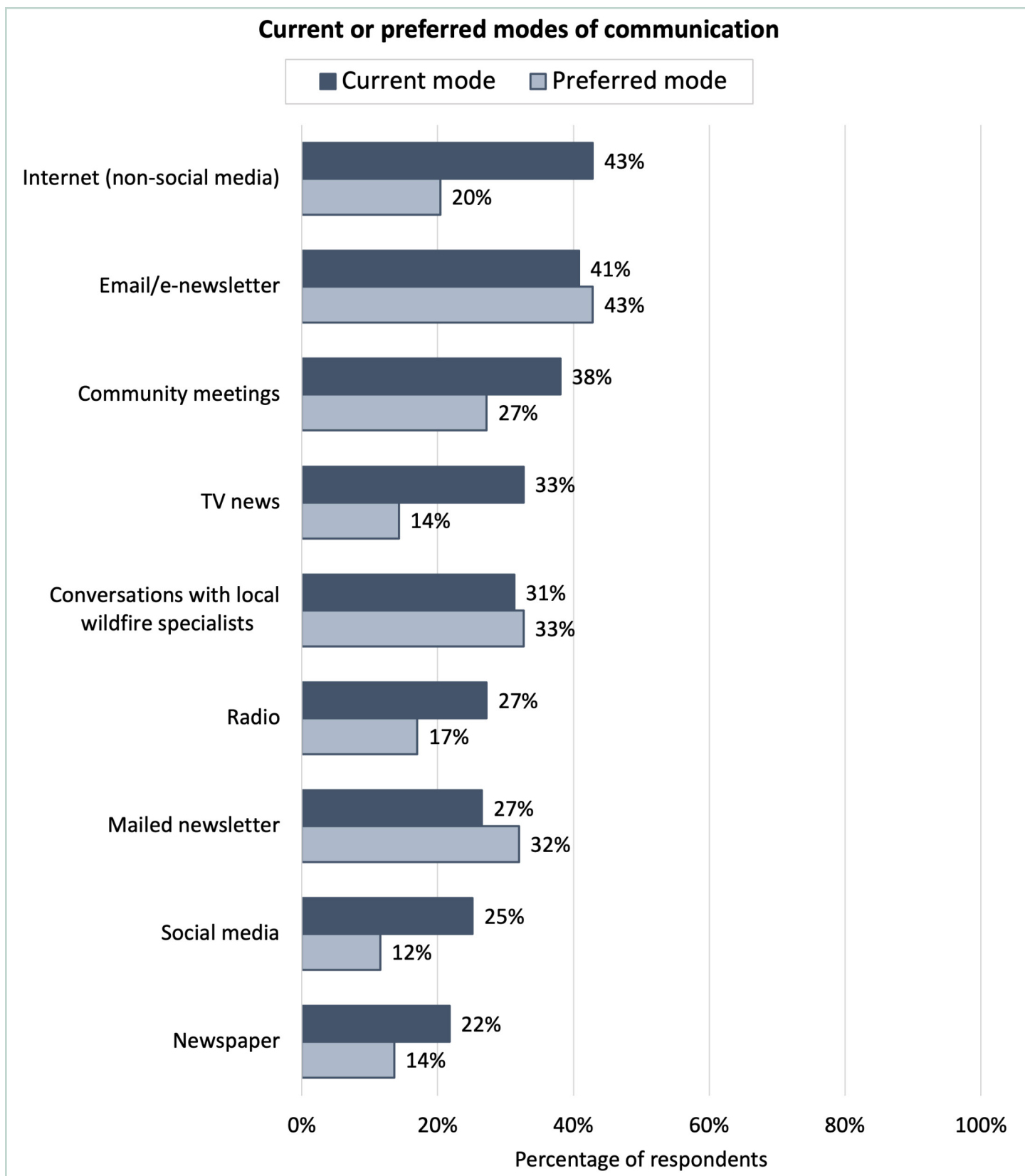


Figure 30—Comparison of current and preferred modes of communication about wildfire risk, ordered by current modes of communication, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. Survey respondents were able to select multiple options. N = 147 respondents to current modes; N = 147 respondents to preferred modes.

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 (75%) reported having evacuation plans for the people in their households (refer to fig. 31a). Among survey respondents with pets, 68 percent had an evacuation plan for their animals (refer to fig. 31b). However, 24 percent of survey respondents with livestock had a plan for their animals (refer to fig. 31c).

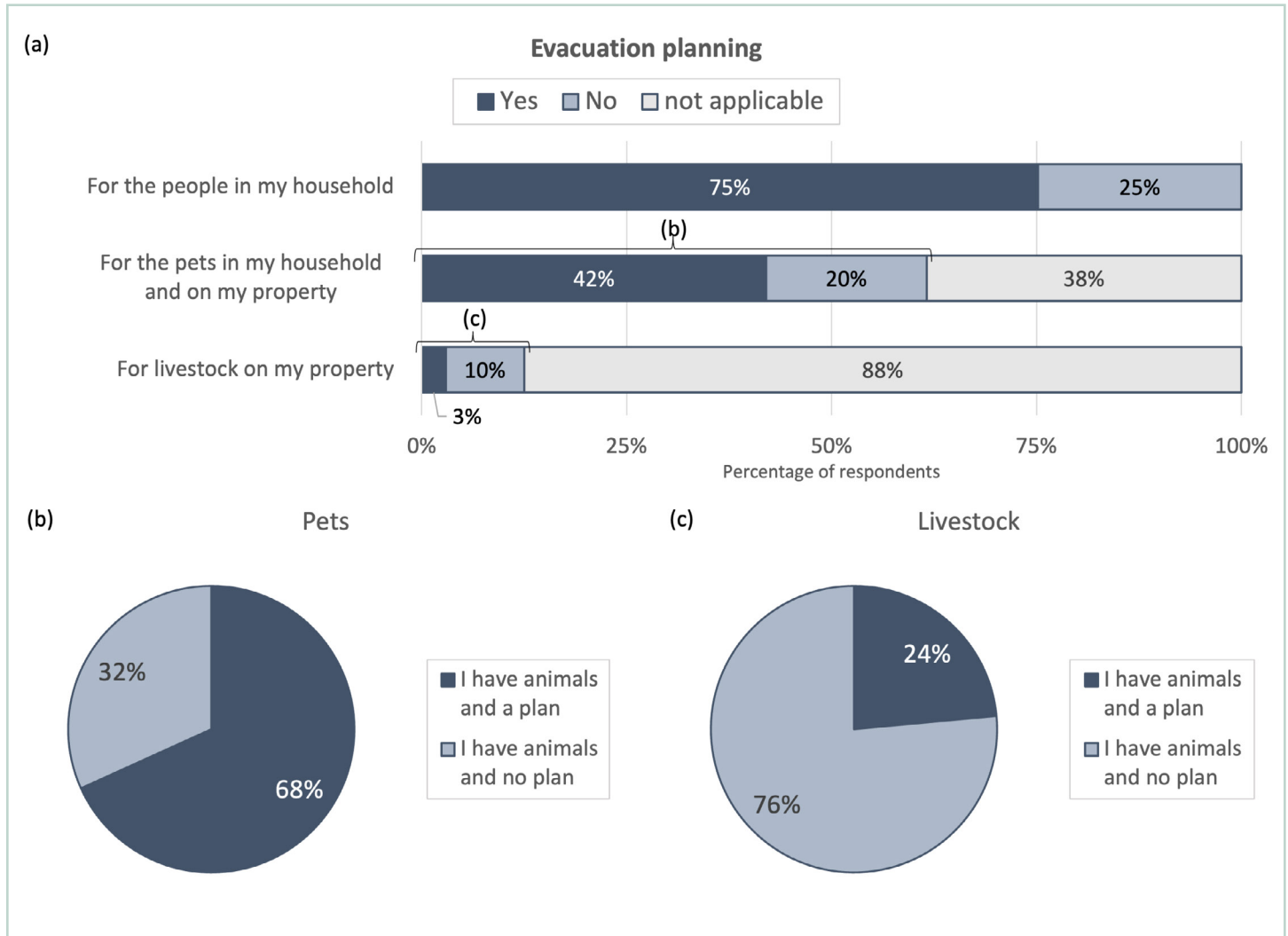


Figure 31—(a) Percentage of survey respondents who report having wildfire evacuation plans for people in the household and for pets and livestock, out of all responses to this question (n=136–141). (b) Of respondents with pets, percentage who have a wildfire evacuation plan for their pets (n=85). (c) Of respondents with livestock, percentage of have a wildfire evacuation plan for their livestock (n=17). Data as reported in 2024 by survey respondents residing in the Cooper Landing, Kenai Peninsula Borough, Alaska, study area.

Respondents were asked to report the evacuation actions they had completed and to identify evacuation topics on which they wanted more information. In line with the three-quarters of respondents stating they had an evacuation plan for the people in their household (refer to fig. 31a), many had completed several key steps of that plan. Most respondents have reported

that they have identified what to take and what to leave behind (73%), safe evacuation routes (66%), where to stay long-term (62%), and where to evacuate to (59%).

However, actions like signing up for emergency notification (58%), identifying how to be notified (57%), and creating an evacuation checklist (30%) had lower completion rates. These actions also had the highest percentage of respondents interested in more information: 27 percent, 31 percent, and 30 percent, respectively. Refer to figure 32.

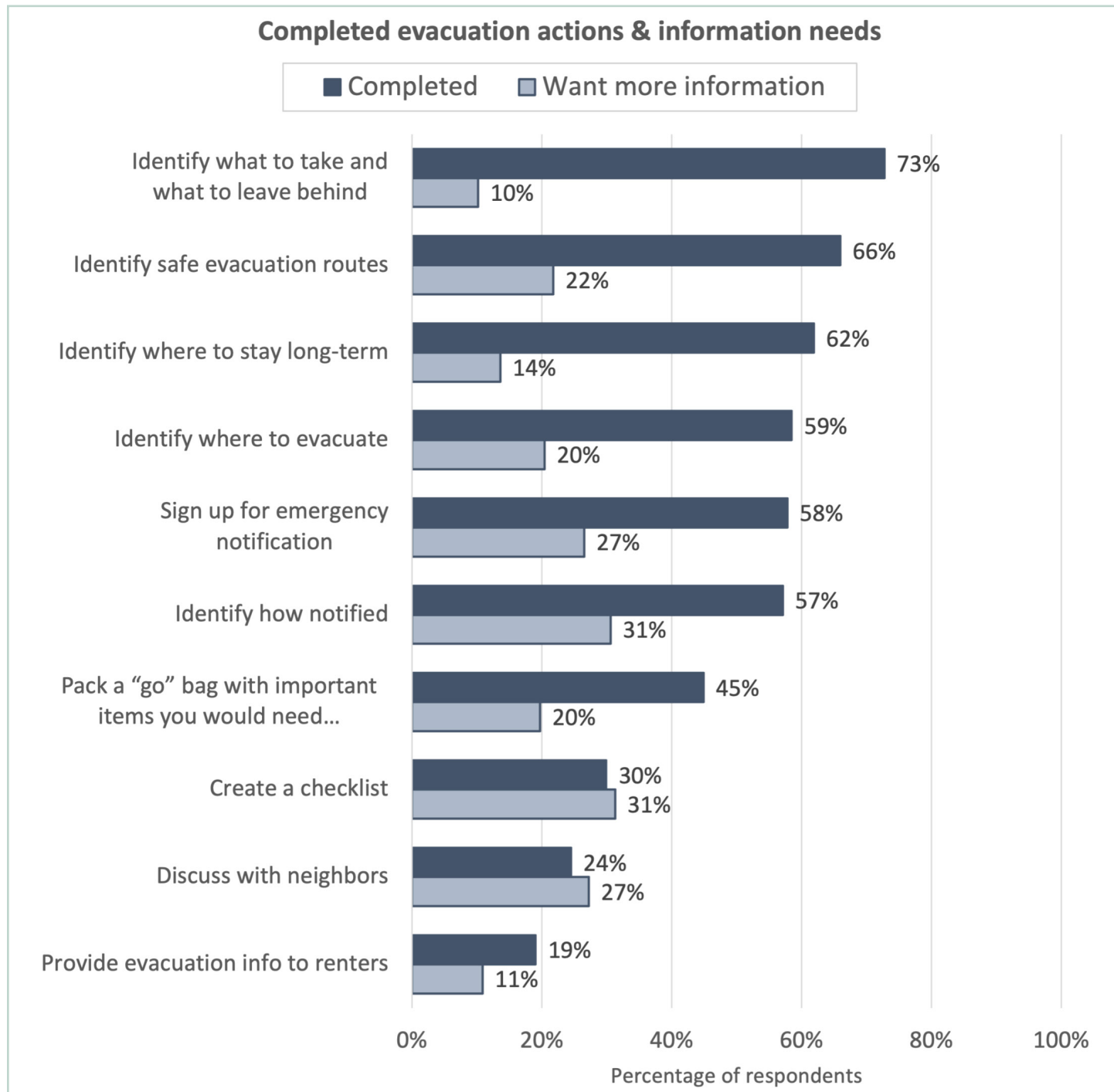


Figure 32—Evacuation preparations completed and information that would be helpful in evacuation plan development, ordered by actions completed, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 147 respondents to 'completed' action segment; N = 147 respondents to 'want more information' segment.

Wildfire risk mitigation—

There are many ways property owners can reduce the risk of wildfire damaging or destroying their homes. Respondents reported high levels of mitigation actions on their properties. The three most reported activities were reducing vegetation (96%), regularly clearing their roof and gutters (79%), and regularly mowing and raking around their residence (73%). Less common mitigation activities on their properties included hardening their homes (45%), having met with a wildfire professional to evaluate their home's risk (34%), and having obtained a permit to burn in 2023 (15%). Respondents reported fewer mitigation activities beyond their own properties, such as helping neighbors reduce vegetation on their properties (42%), participating in a community wildfire activity (22%), interacting with public land managers about fuels reduction (22%), helping reduce vegetation on community property (17%), helping reduce vegetation on nearby public lands (15%), and having obtained a permit to cut trees in the last 2 years (9%). Refer to figure 33.

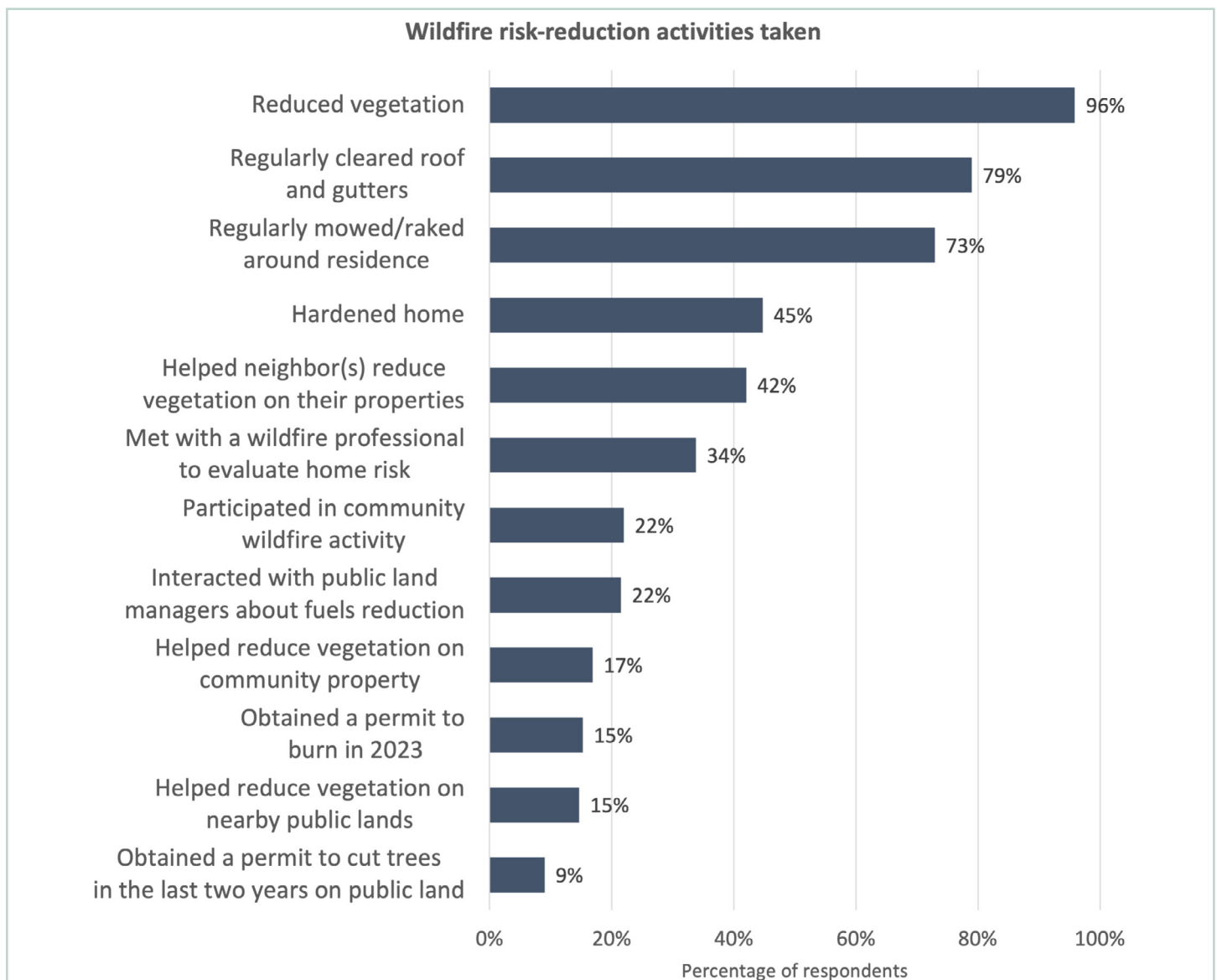


Figure 33—Percent of respondents who reported doing the above wildfire risk mitigation activities, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 138–145 respondents for each of the above activity statements.

Barriers to conducting mitigation—

Respondents were asked about four categories of potential barriers to conducting wildfire mitigation:

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

The top two reported barriers across all categories were in the personal resources category: physical ability to do work (40%) and time to do the work (40%). Additionally, over one-quarter of respondents (28%) reported that the financial expense of mitigating was a barrier, while nearly one-third (32%) of the respondents indicated that none of the three personal resources factors were barriers to wildfire mitigation (refer to fig. 34).

In the lack of specific information category, a large percentage of respondents (70%) reported that three factors in this category were not barriers. The most reported barrier in this category was the lack of information on how to reduce wildfire risk on their property (16%), followed by lack of information on where to dispose of vegetation or slash (15%) and lack of information on factors contributing to their properties' wildfire risk (14%) (refer to fig. 35).

Most respondents (79%) indicated that none of the three personal perspectives were barriers to conducting mitigation. Among those who reported barriers, ten percent did not want to change the way their property looks, 7 percent did not think that taking action would reduce their property's wildfire risk, and 7 percent thought it was a low priority (refer to fig. 36).

Similarly, a significant percentage of survey respondents (78%) reported that community-related factors were not barriers to conducting wildfire mitigation activities. Less than one-fifth (16%) of respondents indicated that a lack of options for disposing of vegetation/slash was a barrier, and even fewer identified restrictions on changes that could be made to their properties as a barrier (5%). Almost none of the respondents cited social pressure from neighbors (1%) as a barrier (refer to fig. 37).

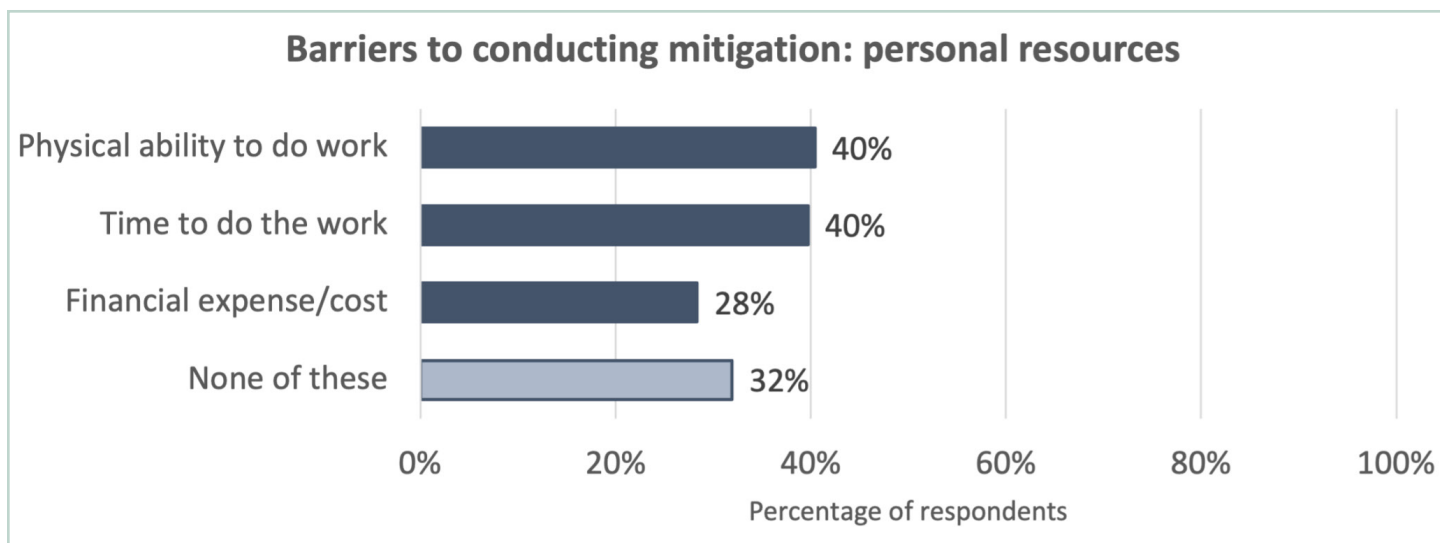


Figure 34—Personal barriers to conducting wildfire mitigation activities on property, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 141 respondents for each of the above barriers.

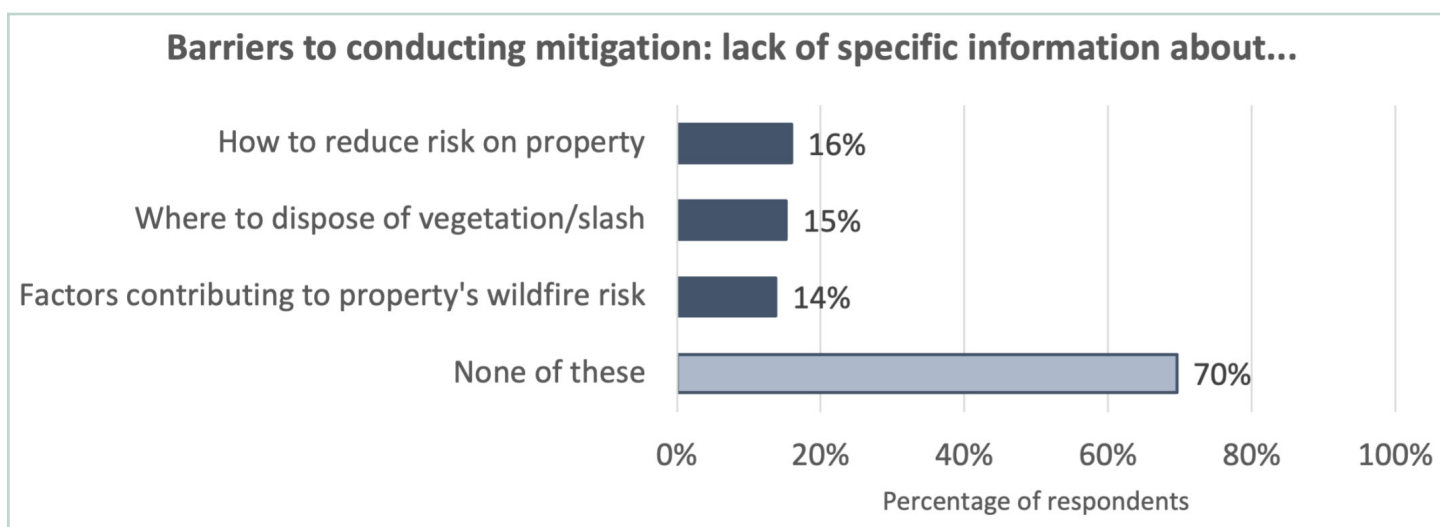


Figure 35—Information barriers to conducting wildfire mitigation activities on property, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 138 respondents for each of the above barriers.

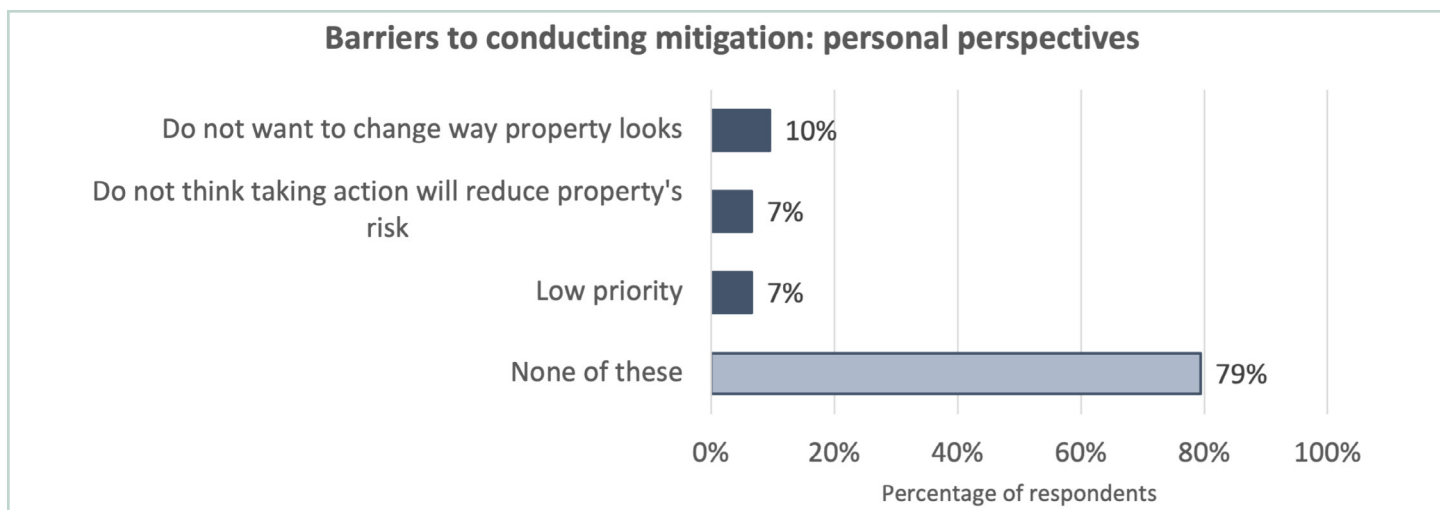


Figure 36—Personal perspectives or values that might affect wildfire mitigation activities on property, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 136 respondents for each of the above barriers.

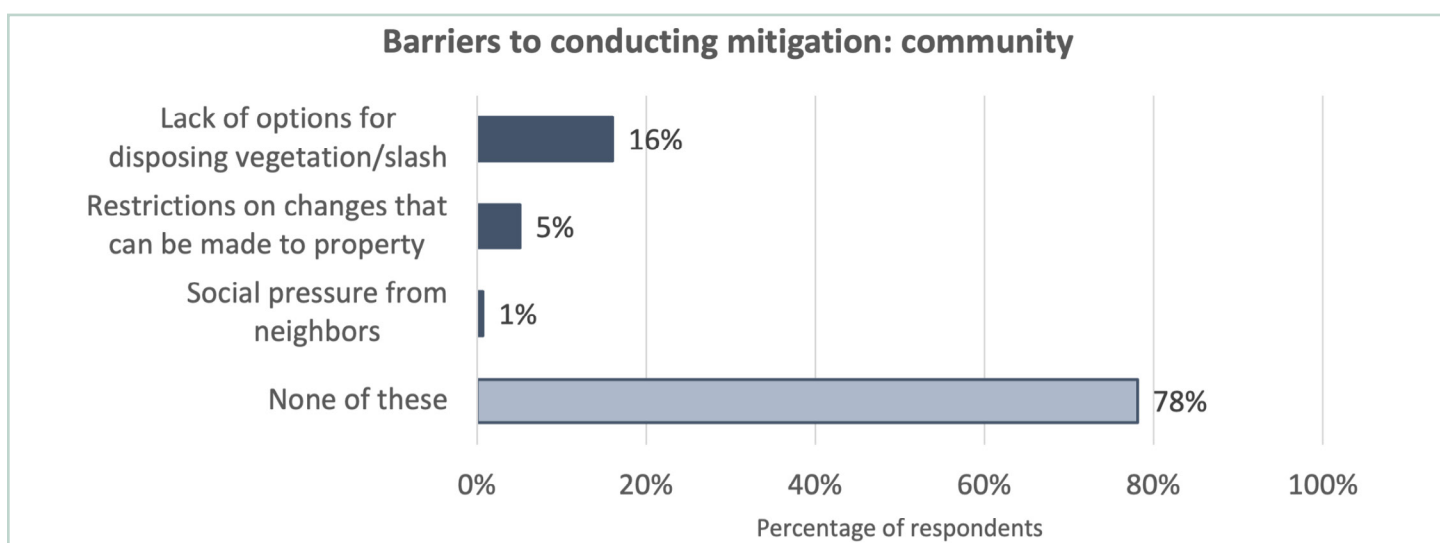


Figure 37—Community-related barriers to conducting wildfire mitigation activities on property, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 137 respondents for each of the above barriers.

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

Four incentives across all sections appealed to one-half or more of the respondents. In the resources category, two of those most selected incentives were help with doing the work (52%) and cost-sharing or financial assistance (50%). Far fewer respondents indicated that

recommended contractors (17%) were an incentive. Almost one-quarter (24%) of respondents reported that none of these incentives would encourage them to undertake wildfire mitigation activities (refer to fig. 38).

The other two most popular incentives across all categories were in the information category: a one-on-one visit with wildfire risk experts (58%) and a report describing their properties' wildfire risk factors (51%). Nearly a quarter (22%) of survey respondents indicated that videos showing how to reduce risk would motivate them to conduct wildfire mitigation activities. Additionally, 28 percent of survey respondents indicated that none of the incentives in this category would encourage them to complete wildfire mitigation activities on their properties (refer to fig. 39).

Social incentives to encourage wildfire mitigation were less popular among survey respondents. Thirty-nine percent of respondents reported that receiving feedback on work done to reduce their property's risk would be beneficial, 22 percent reported that a neighborhood group organizing wildfire risk-reduction activities would be helpful, and 9 percent indicated that recognition would motivate them to perform wildfire mitigation. One-half of the respondents (50%) indicated that none of these social incentives would encourage them to conduct wildfire mitigation (refer to fig. 40).

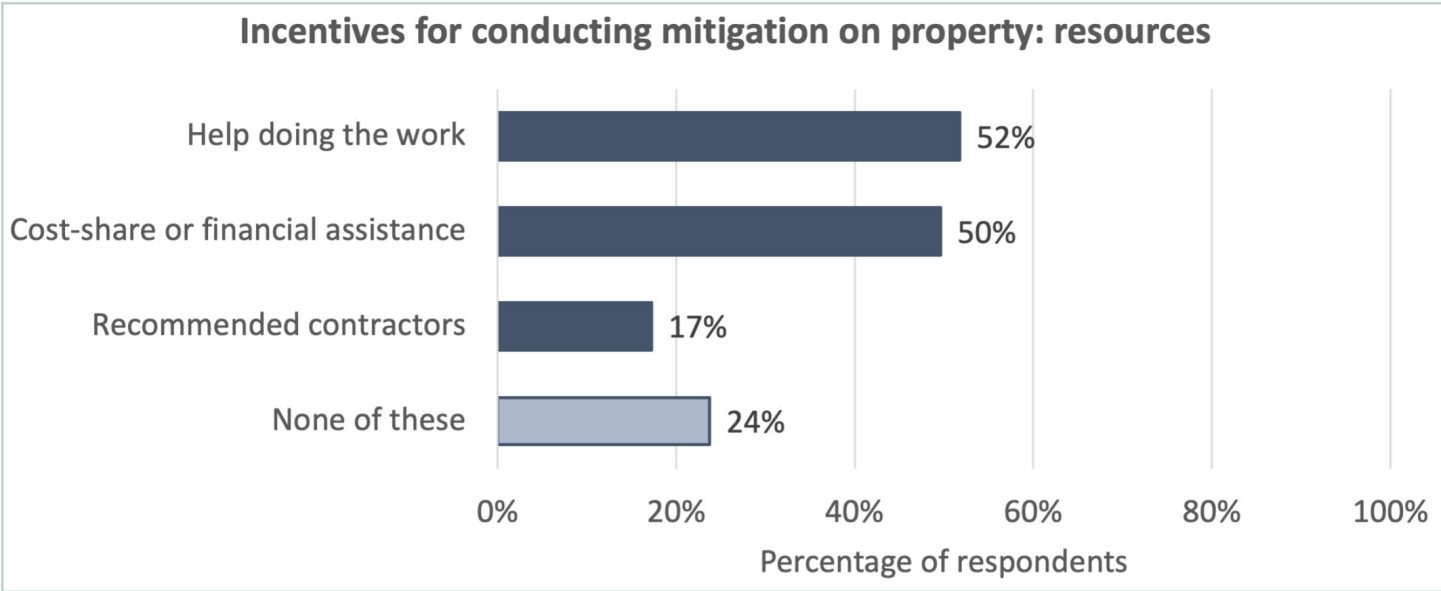


Figure 38—Resource-related incentives for conducting wildfire mitigation activities on property, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 139 respondents for each of the above incentives.

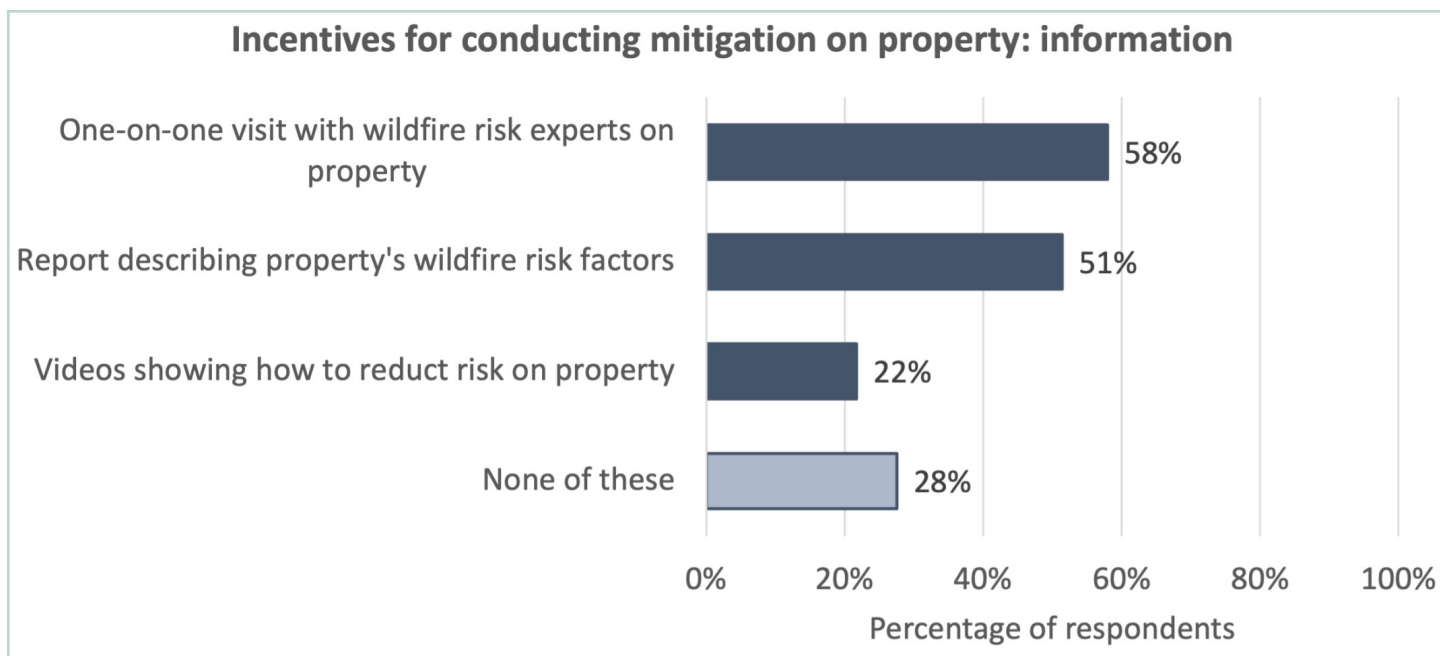


Figure 39—Information-related incentives for conducting wildfire mitigation activities on property, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 138 respondents for each of the above incentives.

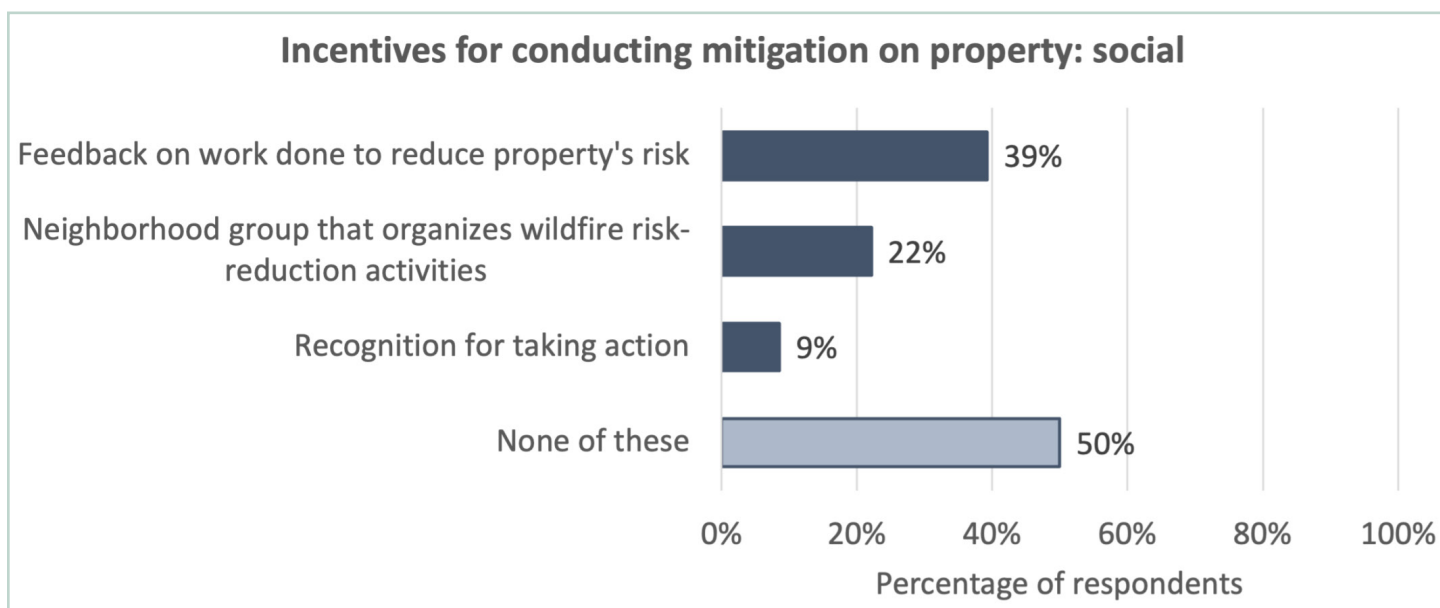


Figure 40—Other incentives for conducting wildfire mitigation activities on property, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 140 respondents for each of the above incentives.

Perceptions of Community Risk Reduction Strategies and Fire Management

Support for risk management practices—

Most survey respondents rated fuels treatments on nearby public lands as very or extremely acceptable. Among the fuels treatments with the highest level of acceptability was removing vegetation along utility right of ways to reduce fire starts (87%), removing trees and other

vegetation (thinning) on nearby public lands (82%), removing vegetation along roadways to ensure safer evacuation (77%), creating a fuel break on nearby public lands (72%), and removing fire-prone trees and replacing them with fire-resistant trees (72%) (refer to fig. 41). While less accepted, more than one-half of respondents still found burning piles of vegetation (69%) and allowing residents to reduce vegetation (52%) on nearby public lands very or extremely acceptable. The least acceptable fuel treatment was allowing a naturally ignited fire to burn, with only 31 percent finding it very or extremely acceptable (refer to fig. 41).

Between one-third and one-half of the survey respondents indicated that proposed wildfire regulations and practices were very or extremely acceptable. The most accepted wildfire regulation was temporarily shutting off the power grid during extreme fire risk days (46%), followed by managing the forest prior to a wildfire to reduce negative impacts on water resources (40%), adopting growth policies and regulations for new development in fire-prone areas (36%), and adopting development standards that require vegetation management (36%) (refer to fig. 42).

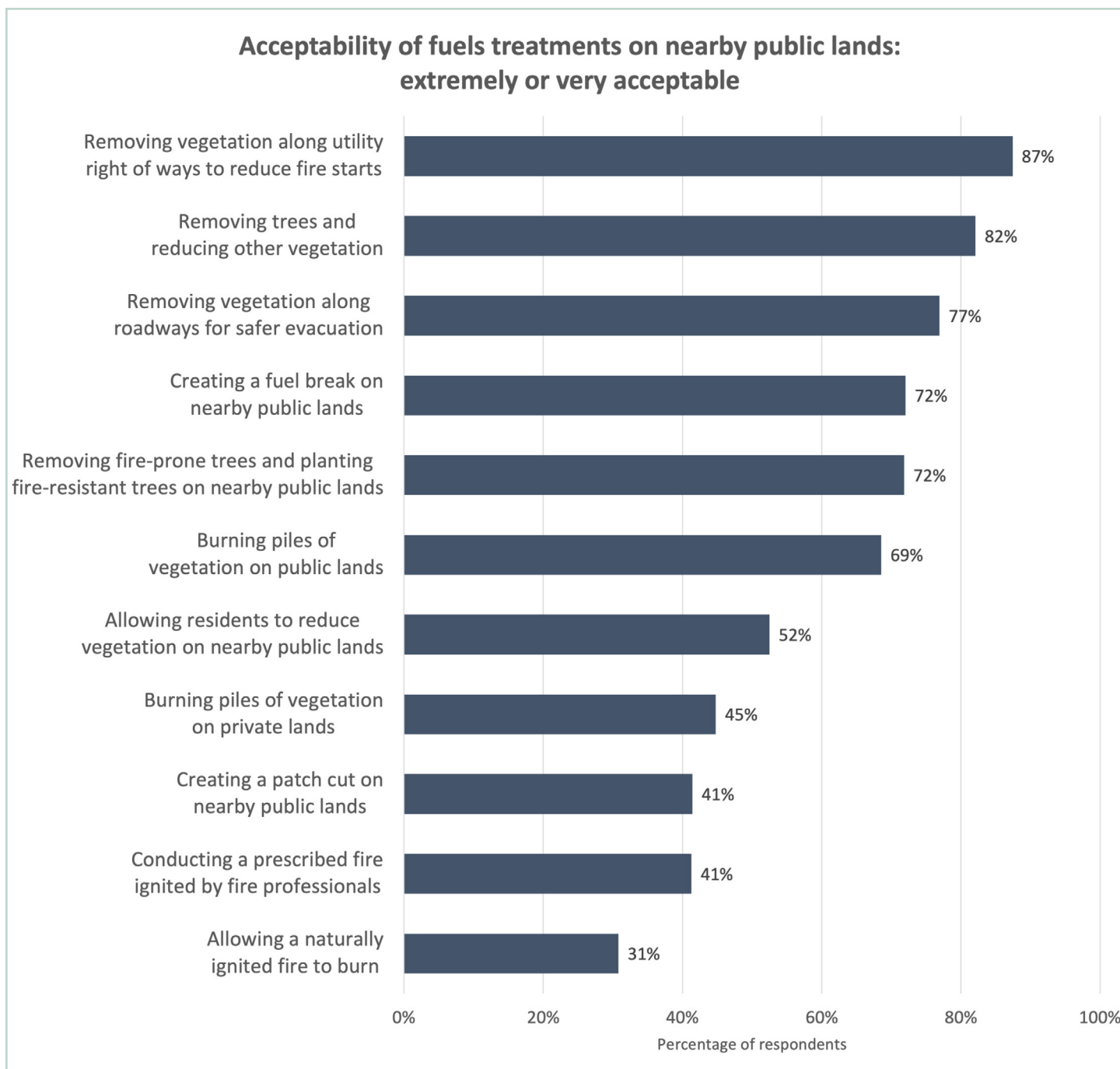


Figure 41—Percentage of respondents who found each of the above wildfire fuels management approaches very or extremely acceptable, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 140–145 respondents for each of the above statements.

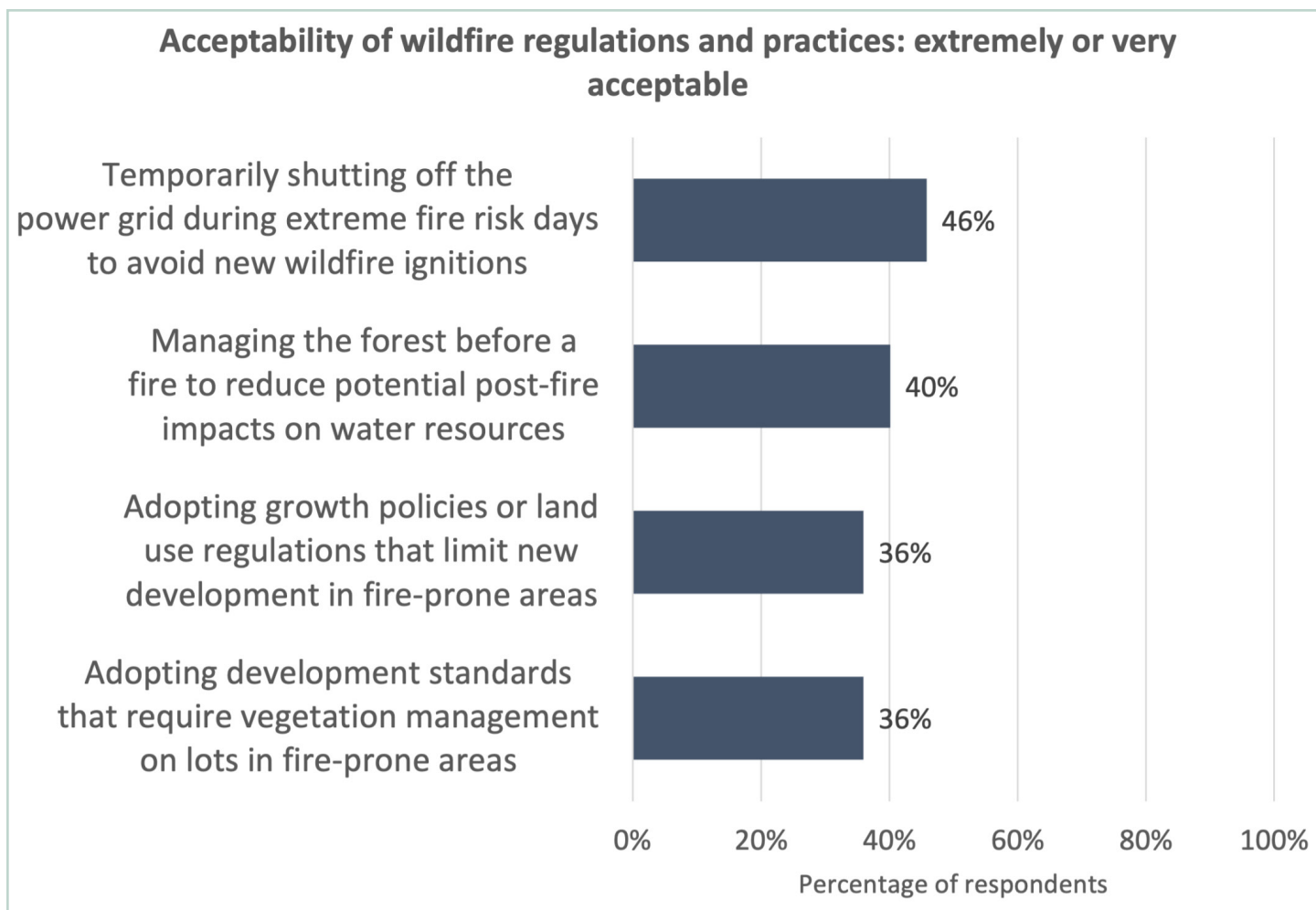


Figure 42—Percentage of respondents who found each of the above wildfire-related policies very or extremely acceptable, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 142–144 respondents for each of the above statements.

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 are a natural part of a healthy forest (88%). (refer to fig. 43).

Respondents reported little confidence in the available technology and resources to suppress wildfires. While almost all respondents stated that reducing risk on their property would help improve firefighter safety (96%), very few agreed or strongly agreed that all wildfires could be controlled with technology (8%) or that firefighters had sufficient resources to protect threatened homes (6%). Additionally, most respondents felt they would get an evacuation notice in time to safely evacuate (59%) (refer to fig. 44).

Few respondents agreed or strongly agreed that wildfires threaten their community's water supply (14%) (refer to fig. 45).

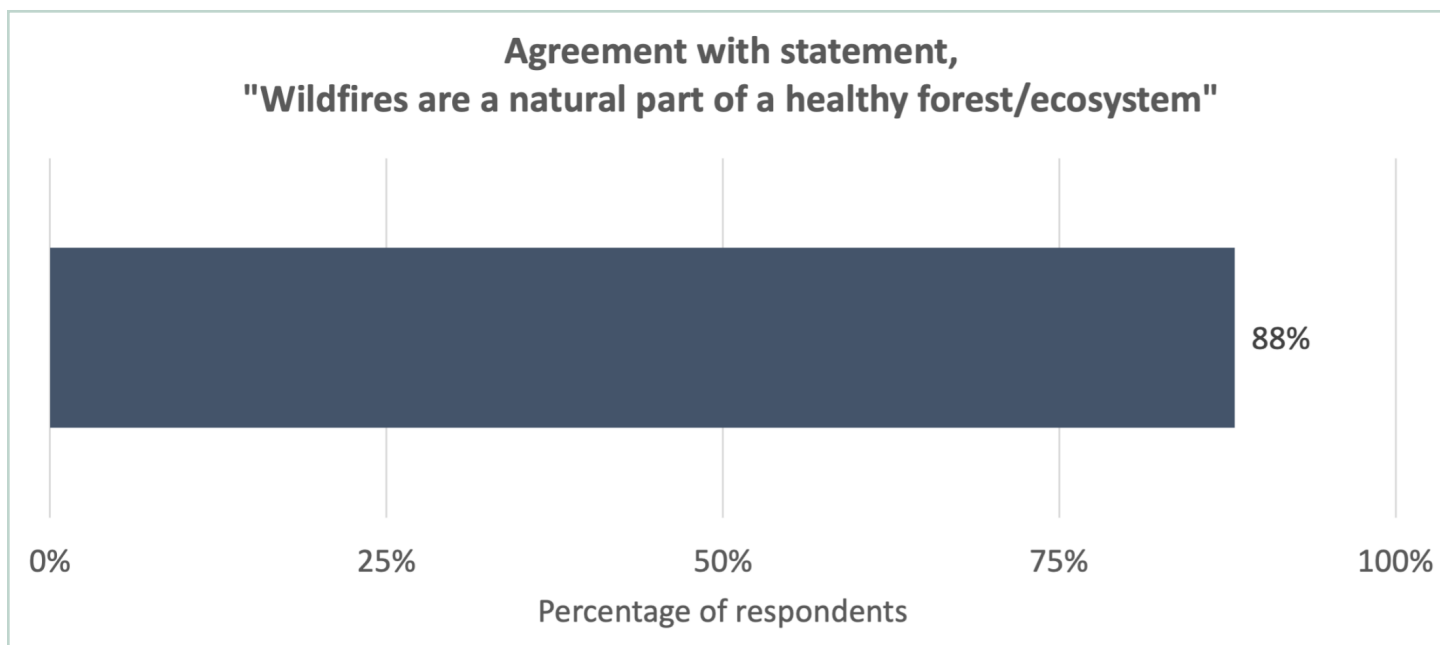


Figure 43—Agreement (“agree” or “strongly agree”) with the statement that wildfires are a natural part of a healthy forest/ecosystem, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 142 respondents to the survey statement listed.

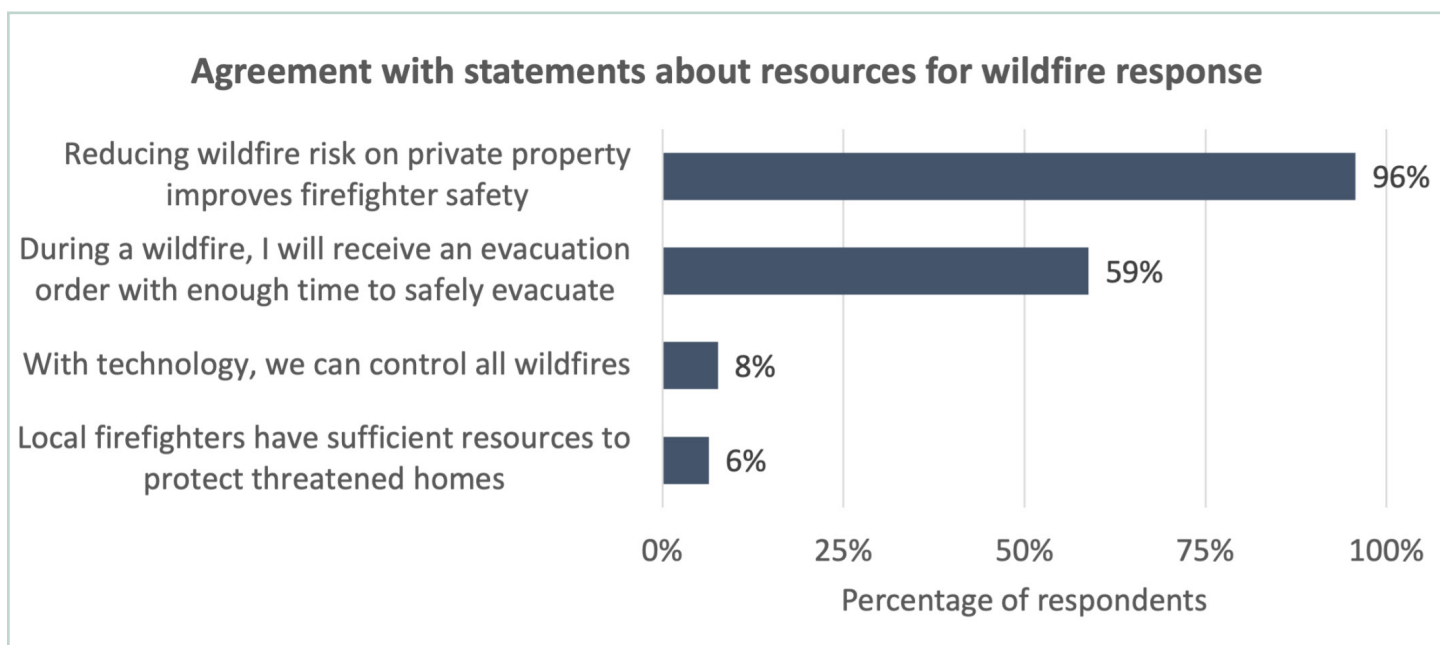


Figure 44—Agreement (“agree” or “strongly agree”) with statements about available technology and resources to prevent wildfire impacts, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 141–143 respondents to each survey statement listed.

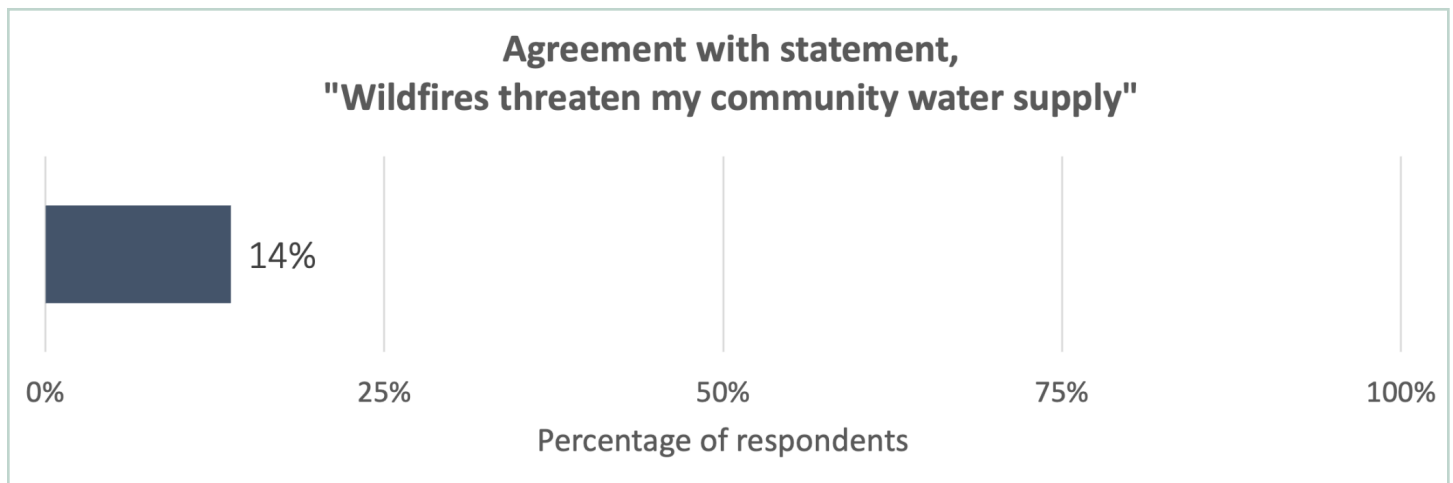


Figure 45—Agreement (“agree” or “strongly agree”) with statements about whether wildfire threatens the respondent’s property and water supply, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 139–141 respondents to the survey statement listed.

Lastly, survey respondents indicated that they feel responsible for reducing their wildfire risk and are confident in the effectiveness of their efforts. Nearly one-third (30%) agreed or strongly agreed that residential development in fire-prone areas increases the wildfire risk to their property. Additionally, 28 percent felt that their efforts to mitigate wildfire risk on their properties were undermined by heavy vegetation on neighboring properties. However, few agreed or strongly agreed with the statement that homeowners’ actions to reduce risk are not effective (5%) or that they live here for the trees and will not remove any to reduce risk (3%) (refer to fig. 46).

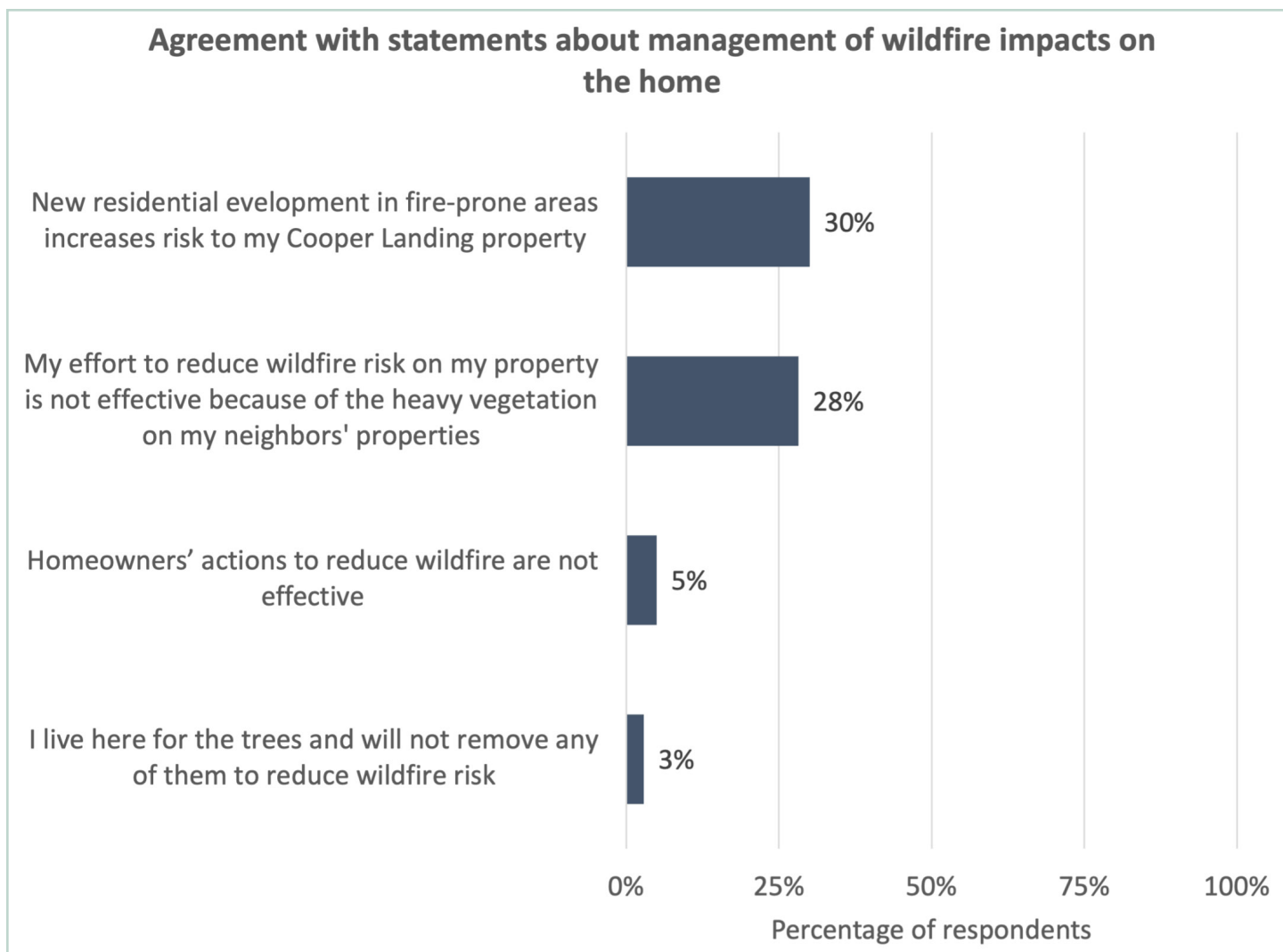


Figure 46—Agreement (“agree” or “strongly agree”) with statements about personal and community management of wildfire impacts on the respondent’s home, as reported in 2024 by respondents residing in the study area in Cooper Landing, Kenai Peninsula Borough, Alaska. N = 140–142 respondents to each survey statement listed.

Conclusion

This report focuses on the results of a project in Cooper Landing, Kenai Peninsula Borough, Alaska developed and implemented in collaboration with the KPB OEM and CLES. The parcel-level wildfire risk assessments, while rapid and comprised of only 13 attributes, provide a snapshot of all the accessible residential parcels in the Cooper Landing community. Paired with household survey data, insights become available to demonstrate the distribution of risk within the community and to provide understanding of the people who make decisions about those properties.

Survey respondents reported high levels of wildfire risk awareness and some wildfire experience, primarily through wildfire evacuation (figs.18–21). Most respondents report taking action to reduce risk on their properties (fig.33); however, they still report that they think that there is a high likelihood of experiencing damage and losses if there is a wildfire on their property (figs. 22, 24). Further, respondents identify vegetation across land types (their neighbors', public lands, and own property) as the primary contributors to the chances of experiencing wildfire damage in the next twelve months (fig. 26).

Survey respondents' primary barriers and preferred incentives for taking action to mitigate wildfire risk rested in the domain of personal resources including help doing the work (physical and time) and cost-sharing or financial assistance to help them take action (figs. 34 and 38). Most respondents reported having an evacuation plan for the people in their households (fig. 31) and had completed a notable portion of specific steps to create a comprehensive evacuation plan (fig. 32). Despite this, respondents indicated interest in evacuation preparedness information indicating an appetite for engagement on this topic. Of note: just over a quarter (29%) of properties had adequate address postings that facilitate quick and safe emergency response during an emergency event (fig.14), and 59 percent agreed or strongly agreed they would receive an evacuation notice with enough time to safely evacuate (fig. 44).

The WiRē RA also demonstrates the presence of dense vegetation in the area 100–150 feet from the home, which may be on the respondents' property, neighbors' private property or on adjacent public lands (fig.13). Respondents indicate overall high levels of acceptability of a wide range of approaches to reduce fuels on nearby public lands. Respondents indicate higher acceptability of non-fire methods to remove fuels (e.g. fuel breaks, thinning) and indicate broad support for such methods targeting the protection of critical infrastructure (e.g., utility right of ways and roadways). Acceptability of fire-based methods to reduce fuels was lower: 69 percent reported burning piles of vegetation is extremely or very acceptable, while 41 percent reported the same for prescribed fire (fig. 41).

Results indicate that respondents received information from a wide range of sources for wildfire risk information and found a notable portion of sources to be extremely or very useful (figs. 29, 30). Given that results indicate high engagement with CLES and Office of Emergency Management, WiRē collaborated to create a two-page mailer highlighting key mitigation and evacuation information resources (refer to Appendix F).

Appendix A: Correspondence Materials and Household Survey

Correspondence Materials.....	49
Household Survey	57



Dear Cooper Landing Resident,

The Cooper Landing Emergency Services and Kenai Peninsula Borough Emergency Management are dedicated to helping our community prepare for the eventuality of wildfire. While fire is an important part of the natural ecosystem, large and intense fires have the potential to devastate homes and lives. In 2019, the Swan Lake Fire not only transformed the landscape in the areas around our community, but impacted our focus on fire prevention, mitigation, and preparedness.

Our goal is to be proactive in confronting wildfire before another disaster occurs. Therefore, Cooper Landing Emergency Services and Kenai Peninsula Borough Emergency Management 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 study will have two components: parcel-level wildfire risk assessments and a mail-in survey.

Wildfire Risk Assessment

This summer, beginning the weekend of May 20th, Cooper Landing Emergency Services personnel and various local agencies will conduct parcel-level wildfire risk assessments from the road; no trespassing will occur. We will also use existing aerial imagery from 2020/2021 to determine how each household can be better prepared to survive a wildfire. These parcel-level assessments are a quick overview of the property characteristics that contribute to wildfire risk, including roof type, vegetation density, and evacuation routes.

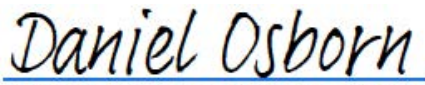
Living with Wildfire in Cooper Landing in 2023 Survey

The second part of the study 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 Fall/Winter. 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. A project report will be available in the first half of 2024, at the conclusion of the project.

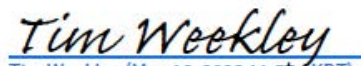
If you have any questions about the parcel-level wildfire risk assessments or the survey, please email us at oem@kpb.us or call 907-262-4910.

Thank you for participating.

Sincerely,


Daniel Osborn (May 16, 2023 11:55 AKDT)

Dan Osborn
Fire Chief
Cooper Landing Emergency Services


Tim Weekley (May 16, 2023 11:55 AKDT)

Tim Weekley
Operations Manager
Kenai Peninsula Borough, Emergency Response Center

Dear Cooper Landing Resident,

Cooper Landing Emergency Services, the Kenai Peninsula Borough Emergency Management, the University of Colorado, and the Wildfire Research Center are partnering to send the “Living with Wildfire in Cooper Landing in 2023” survey. To create the most effective programs possible, Cooper Landing Emergency Services 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 Cooper Landing Emergency Services better prepare for future fires as well as improve our outreach and education efforts. Results from the study will be available in the first half of 2024, 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 email us at oem@kpb.us or call 907-262-4910.

Sincerely,

Dan Osborn
Fire Chief
Cooper Landing Emergency
Services



Tim Weekley
Operations Manager
Kenai Peninsula Borough
Emergency Response Center



Hannah Brenkert-Smith
Institute of Behavioral Science
University of Colorado



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:

Sign up for emergency notifications:

<https://my.kpb.us>



Prepare for wildfire.
More info here:

<https://info.kpb.us>



Dear Cooper Landing Resident,

We recently sent you the “Living with Wildfire in Cooper Landing in 2023” survey. We realized after we sent the survey that there was a glitch with the return envelope, and the prepaid postage was not attached. **Please find the necessary return postage in this letter and apply it to the return envelope with your completed survey.**

If you have not had a chance to open or complete 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.

Sincerely,

Dan Osborn
Fire Chief
Cooper Landing Emergency
Services



Tim Weekley
Operations Manager
Kenai Peninsula Borough
Emergency Response Center



Hannah Brenkert-Smith
Institute of Behavioral Science
University of Colorado



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Sign up for emergency
notifications:

<https://my.kpb.us>



Prepare for wildfire.
More info here:

<https://info.kpb.us>



Dear Cooper Landing Resident,

We recently requested your participation in an important survey about living with wildfire on the Kenai Peninsula. We apologize again for the return postage error in the first survey mailing. This mailing has the necessary return postage. Many residents have already completed and returned the survey. If you have returned the survey, thank you for your participation. If you have not yet responded, please complete and return the enclosed survey. We would like to hear from you so we can consider your opinions.

The “Living with Wildfire in Cooper Landing in 2023” survey is a collaborative effort between Cooper Landing Emergency Services, the Kenai Peninsula Borough Office of Emergency Management, the University of Colorado, and the Wildfire Research 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.

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 email us at oem@kpb.us or call 907-262-4910.

Sincerely,

Dan Osborn
Fire Chief
Cooper Landing Emergency
Services



Tim Weekley
Operations Manager
Kenai Peninsula Borough
Emergency Response Center



Hannah Brenkert-Smith
Institute of Behavioral Science
University of Colorado



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:

Sign up for emergency notifications:

<https://my.kpb.us>



Prepare for wildfire.
More info here:

<https://info.kpb.us>



Dear Cooper Landing Resident,

We recently sent you the “Living with Wildfire in Cooper Landing in 2023” survey. You should have also received a follow-up letter that included the needed postage that was mistakenly left off the return envelope in the original mailing. If you have recently returned the survey, thank you for your participation!

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.

Sincerely,

Dan Osborn
Fire Chief
Cooper Landing Emergency
Services



Tim Weekley
Operations Manager
Kenai Peninsula Borough
Emergency Response Center



Hannah Brenkert-Smith
Institute of Behavioral Science
University of Colorado



Living with Wildfire in Cooper Landing in 2023



Kenai Peninsula Borough
Office of Emergency Management
253 Wilson Ln, Soldotna, AK 99669

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

When choosing a response, please fill in the circle completely. Correct:  Incorrect:    

1.1. Do you own or rent your Cooper Landing 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 Cooper Landing 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 Cooper Landing 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 in to your Cooper Landing home? (*Fill in the blank*)

_____ Year moved to my Cooper Landing home

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

_____ Year my Cooper Landing home was built

1.6. How aware of wildfire risk were you when you bought or decided to rent your Cooper Landing 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 Cooper Landing home.

2.1. What is the closest distance (as a crow flies) a wildfire has come to your Cooper Landing 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 Cooper Landing home?
(Fill in one circle per row)

	No	Yes
I have evacuated from my Cooper Landing home due to a wildfire or threat of a wildfire	☐	☐
My Cooper Landing home has had wildfire smoke damage	☐	☐
My Cooper Landing home has had wildfire damage	☐	☐
My Cooper Landing home was destroyed by a wildfire	☐	☐

2.3. Do you currently have an evacuation plan in the event a wildfire threatens your Cooper Landing 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 (KPB Alerts at https://my.kpb.us)	☐	☐
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 **homeowner’s insurance** for your Cooper Landing home. *(Fill in one circle per row)*

	No	Yes	Don’t know
Do you currently have homeowner’s insurance?	☐	☐	
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 wildfire?	☐	☐	☐
Has an insurance company ever required you to take action to reduce wildfire risk in order to continue coverage?	☐	☐	☐

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

3.1. Does your Cooper Landing 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 Cooper Landing home have any of the following exterior siding materials?

(Fill in all that apply)

- ☐ Stucco, cement, brick, stone, or other noncombustible siding
- ☐ Log or heavy timbers
- ☐ Wood or vinyl siding

3.3. Does your Cooper Landing 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 Cooper Landing home to combustible items other than vegetation 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 your property? *(Fill in one circle)*

- ☐ More than 30 feet or no combustible items
- ☐ 5 – 30 feet
- ☐ Less than 5 feet

3.5. What is the **closest** distance from your Cooper Landing 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 the vegetation just beyond 100 feet from your Cooper Landing home (about 6 car lengths)? That area might be outside your property boundary and include properties immediately surrounding you. (*Fill in one circle*)

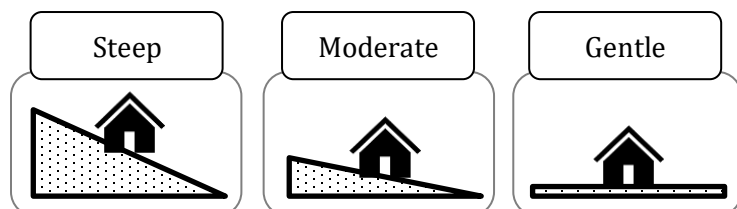
- ☐ Grasses with less than one-foot dead material
- ☐ Isolated shrubs/trees
- ☐ Wooded area with only hardwood trees (birch, aspen, alder, cottonwood) and no small trees/shrubs and tall dead grasses
- ☐ Mixed wooded area with both hardwood (birch, aspen, alder, cottonwood) and spruce trees; no small trees/shrubs and tall dead grasses underneath
- ☐ Mixed wooded area with both hardwood (birch, aspen, alder, cottonwood) and spruce trees; lots of small trees/shrubs and tall dead grasses underneath
- ☐ Dense spruce forest

3.7. What is the **closest** distance from your Cooper Landing 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 Cooper Landing 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 Cooper Landing 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 13.5 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 visible from road?	☐	☐
has contrasting background?	☐	☐
is reflective?	☐	☐
has 3-inch numerals?	☐	☐
is made of durable material?	☐	☐

3.12. If the road you use to access your Cooper Landing 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 Cooper Landing 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 Cooper Landing home (e.g., trees, brush)	☐	☐
Regularly cleared my roof and gutters of leaves and pine needles	☐	☐
Regularly mowed and raked around my Cooper Landing home	☐	☐
Made my Cooper Landing home more fire resistant (e.g., replaced roofing, siding, added screening under eaves)	☐	☐
Helped neighbor(s) reduce vegetation on their properties	☐	☐
Helped reduce vegetation on community property (e.g., parks, gun range, sport fields)	☐	☐
Reduced vegetation on nearby public lands (e.g., borough, state, federal lands)	☐	☐
Participated in a community wildfire preparedness activity (e.g., meeting, chipper day)	☐	☐
Met with a wildfire professional at my Cooper Landing home to evaluate and discuss my property's wildfire risk	☐	☐
Interacted with public land managers about vegetation reduction on nearby public lands	☐	☐
Obtained a permit to burn in 2023 (e.g., for lawn burns, burn barrels, pile burning)	☐	☐
Obtained a permit to cut trees in the last two years on public lands (borough, federal)	☐	☐

4.3. How much do you think each of the following increases the chances of a wildfire damaging your Cooper Landing property **in the next 12 months**? *(Fill 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, cistern, lake) for fire suppression	☐	☐	☐

4.4. How acceptable are the following land management and regulatory approaches to **reducing wildfire risk** in Cooper Landing 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 cut vegetation (slash piles) on nearby public or Borough lands	☐	☐	☐	☐	☐
Removing vegetation along utility right of ways to reduce fire starts	☐	☐	☐	☐	☐
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	☐	☐	☐	☐	☐
Allowing residents to reduce vegetation on nearby public lands	☐	☐	☐	☐	☐
Burning piles of cut vegetation (slash piles) on my or nearby private land	☐	☐	☐	☐	☐
Removing fire-prone trees (spruce) and planting fire-resistant trees (birch, aspen) on nearby public lands	☐	☐	☐	☐	☐
Growth policies or land use regulations that limit new development in fire-prone areas in Cooper Landing	☐	☐	☐	☐	☐
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 technology, we can control all wildfires.	☐	☐	☐	☐	☐
During a wildfire, I will receive an evacuation order with enough time to safely evacuate.	☐	☐	☐	☐	☐
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.	☐	☐	☐	☐	☐
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 vegetation on nearby private or public lands.	☐	☐	☐	☐	☐
Local firefighters have sufficient resources to protect threatened homes.	☐	☐	☐	☐	☐
Reducing wildfire risk on private property improves firefighter safety.	☐	☐	☐	☐	☐
Wildfires threaten my community water supply.	☐	☐	☐	☐	☐
I plan to move out of the area in the next 12 months because of wildfires.	☐	☐	☐	☐	☐
New residential development in nearby fire-prone areas increases the wildfire risk to my Cooper Landing property.	☐	☐	☐	☐	☐

5.2. If there is a wildfire on your Cooper Landing 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 Cooper Landing 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 Cooper Landing 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
Cooper Landing Emergency Services	☐	☐	☐	☐	☐	☐
Community group	☐	☐	☐	☐	☐	☐
Local tree contractor (tree cutter, tree services)	☐	☐	☐	☐	☐	☐
Office of Emergency Management	☐	☐	☐	☐	☐	☐
Local government	☐	☐	☐	☐	☐	☐
Tribal entity	☐	☐	☐	☐	☐	☐
2022 Kenai Peninsula Community Wildfire Protection Plan	☐	☐	☐	☐	☐	☐
Kenai Peninsula Ready-Set-Go! (info.kpb.us)	☐	☐	☐	☐	☐	☐
Alaska Firewise	☐	☐	☐	☐	☐	☐
Kenai National Wildlife Refuge	☐	☐	☐	☐	☐	☐
All Lands All Hands (ALAH)	☐	☐	☐	☐	☐	☐
Alaska Division of Forestry and Fire Protection	☐	☐	☐	☐	☐	☐
Chugach National Forest	☐	☐	☐	☐	☐	☐
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	☐	☐
Social media (Facebook, Twitter)	☐	☐
Conversations with local wildfire specialists	☐	☐
Community meetings	☐	☐
Internet (non-social media)	☐	☐
Mailed newsletter	☐	☐
TV news	☐	☐
Newspaper	☐	☐
Radio	☐	☐

6.3. Do you know the number to reach the Office of Emergency Management call center? *(Fill in one circle)*

- ☐ No
- ☐ Yes

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 Cooper Landing property.

7.1. Do any of the following **limit your ability** to take action to reduce the wildfire risk on your Cooper Landing property (e.g., cutting trees, changing roof/siding)? *(Fill in all that apply for each row)*

Personal resources	Financial cost ☐	Time to do the work ☐	Physical ability to do the work ☐	None of these ☐
Lack of specific information about...	Factors contributing to my property's wildfire risk ☐	How to reduce wildfire risk on my property ☐	Where to dispose of cut vegetation (slash) ☐	None of these ☐
Personal perspectives	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 of cut 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 Cooper Landing property? *(Fill in all that apply for each row)*

Resources	Cost-share or financial assistance ☐	Help doing the work ☐	Recommended tree 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 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. As with all questions in this survey, including those in this section, your name will not 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. Survey results will be reported in summary form and your name will not be connected to your answers in any way. Please use the space below to write any additional comments.



Assessing Wildfire Risk on the Kenai Peninsula

Who we are:

- Kenai Peninsula Borough Office of Emergency Management
- Cooper Landing Emergency Services
- Central Emergency Services – Funny River
- Nikiski Fire Service Area
- The Wildfire Research Center

You're seeing this letter because you may have met someone conducting a rapid wildfire risk assessment for your property. See the frequently asked questions below for more information about the information we're collecting and how it will be used. The assessments are conducted from the road and will take around 3 – 5 minutes.

We will also be mailing you a survey that asks you to rate your own property using the same questions as our assessment, as well as questions about your perceptions of wildfire. The purpose of this effort is to assess residential property-level wildfire risk so that we can better support wildfire preparedness in our communities. To do this, we are partnering with several local volunteers and the Wildfire Research (WiRē) Center, which is a non-profit that works with wildfire practitioners across the western U.S.

Frequently Asked Questions

How will the wildfire risk assessments be used?

The data from this effort will be used to help the emergency responders know how they can best support properties in being ready for wildfire as desired by the property owner. This allows your local fire department to utilize resources most effectively. For example, if we see that most homeowners have poor defensible space around their homes, your local mitigation programming can work on ways to better support homeowners in improving their defensible space. **These data will not be used to force anyone to take any action.**

Who will be able to see the wildfire risk assessment for my property?

This data will not be publicly available at the property level (e.g., nothing that states "1234 Example Rd. has a combustible roof" would be public). That is, only summarized information will be reported publicly (e.g., 10% of houses in the study area have flammable roofs). You can request to see the wildfire risk assessment for your property by contacting the people listed under contact information below.

What information is being collected?

This rapid assessment will collect the following information:

- Roof materials (combustible or non-combustible?)
- Siding materials (combustible or non-combustible?)
- Combustible attachments (present or not present?)
- Distance to adjacent homes (e.g., more than 30' away from another home or closer?)
- Distance to other combustibles (how far away are other combustibles like wood piles from the house?)
- Distance to overgrown vegetation (how far away are highly flammable plants from the house?)
- Distance to dangerous topography (how far from the house is there terrain that increases fire behavior?)
- Slope (how steep is the slope that the house sits on?)
- Adjacent fuels (are the fuels next to the home very dense and connected, or spread out?)
- Address posting (does the address sign meet local standards for visibility by firefighters during an emergency?)
- Ingress/egress (is there more than one way in/out?)
- Driveway length (can a fire truck access this property during a fire as safely as possible?)
- Driveway clearance (can a fire truck access this property during a fire as safely as possible?)

Will the wildfire risk assessments be used to make me take a particular action?

No (see section above: "How will the wildfire risk assessments be used?"). For example, this project will not identify or require trees near homes to be cut down. Not only will data not be used to force any action, but the information we are collecting will not be this detailed. It will only speak to presence/absence of certain risk factors so that we can make our programming better support mitigation efforts on private land.

Contact Information by Community

Community	Office of Emergency Management Representative	Email	Phone number
Cooper Landing	Tim Weekley	tweekley@kpb.us	(907) 262-2095
Funny River	Paul McBride	pmcbride@kpb.us	(907) 262-2097
Nikiski	Brenda Ahlberg	bahlberg@kpb.us	(907) 262-2098

Appendix B: Wildfire Research (WiRē) Assessor Reference Guide

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

WiRē Assessor Reference Guide..... 76
WiRē In-Field Rapid Assessment Instructions 92

Assessor Reference Guide: Nikiski, Funny River, and Cooper Landing Study Areas

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What is in this guide?

This guide serves to orient assessors to the data collected as part of the WiRē Rapid Wildfire Risk Assessment. In Section 1, we describe the Rapid Assessment. In section 2, we provide the **Rapid Assessment Instructions**, which is guidance on how to choose which response category best reflects the condition observed at the parcel regardless of whether the Rapid Assessment is being conducted in-field or remotely. 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 category.

1 What is the WiRē Rapid Wildfire Risk Assessment?

The WiRē Rapid Wildfire Risk Assessment is comprised of 13 attributes that include building materials, vegetation, and other combustibles near the home; background fuels and topography; and access to the property (see Figure 1). To calculate a parcel's overall "risk score" (continuous number on a 1000-point scale), each Rapid Assessment attribute is weighted, reflecting its relative contribution to parcel-level wildfire risk (see Figure 2). For example, because roofing materials can present a more significant risk than address posting, these attributes are weighted differently, constituting 30% and 1% of the overall risk score, respectively.

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.

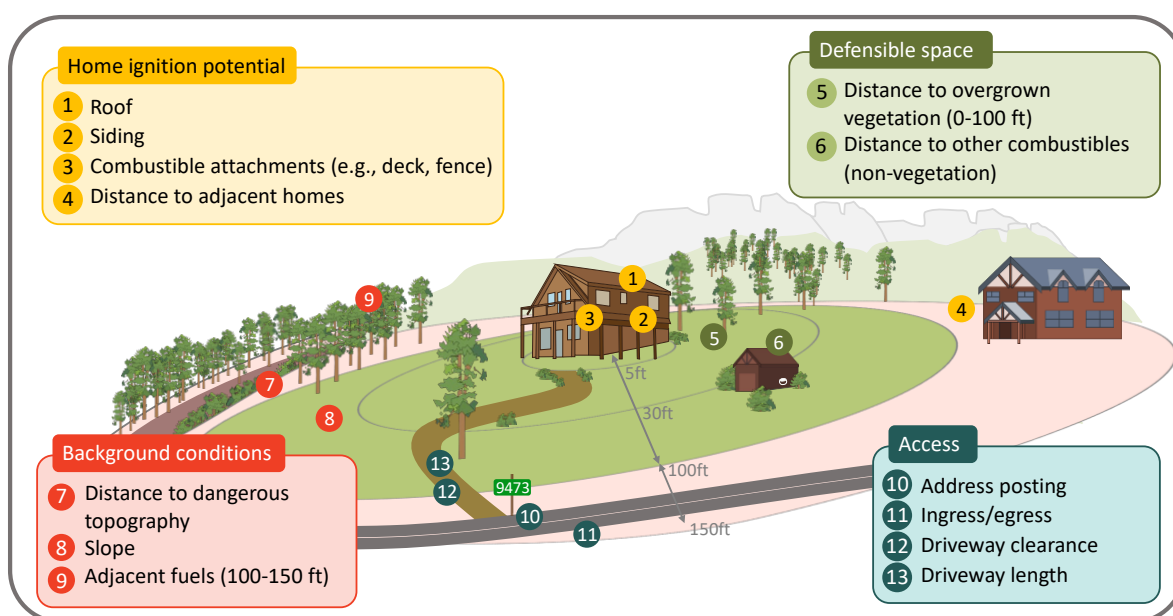


Figure 1. WiRē Rapid Wildfire Risk Assessment: A Visual Guide

Things to keep in mind

- **Risk mitigation, not suppression.** The goal of the risk assessment is to identify potential ways to mitigate risk. While the risk assessment includes dimensions associated with structure protection, it is not specific to wildfire response.
- **Subjectivity.** Wildfire professionals may rate certain components of the WiRē Risk Assessment differently. This guide is intended to help increase consistency across assessors, making the resulting data as consistent as possible.

- **Consistency of messaging.** It's important to build consistency between the risk assessment and the messaging of the rest of your programs.

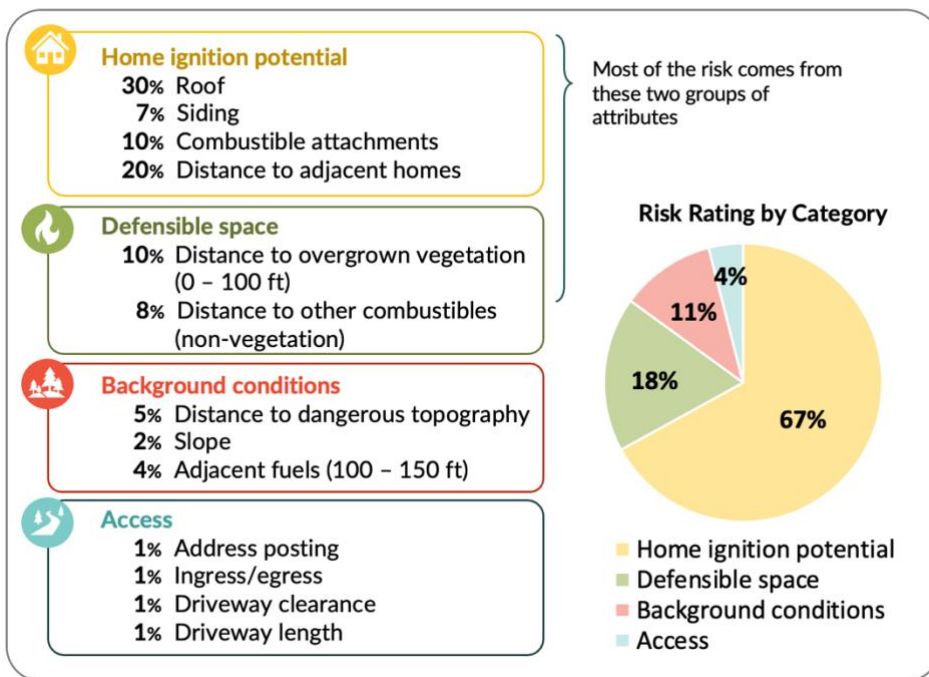


Figure 2. How much does each risk assessment attribute contribute to a property's risk?

2 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 rapid assessment, some of the attributes may be unobservable. For example, in the case of assessments conducted from the road, if the back of the house is not visible from the road, several attributes may be unobservable (e.g., combustible attachments, other non-vegetation combustibles). Similarly, if the assessment is being conducted using aerial imagery, the siding material may not be distinguishable. For these instances, we include an additional response category “unknown/not observed” for all the risk attribute questions.

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.

In the remainder of this section, we present a set of tables (Tables 1 to 6, respectively) organized by the categories: general information, home ignition potential, defensible space,

background conditions, access, and community-specific information. Each table includes the following:

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

Table 1. General information

Attribute (<i>variable name</i>)	Response categories	Attribute suggestions
Structure type (<i>structype</i>) <i>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 with a residential structure.</i>		
What is the primary use of this structure?	Residential	Select the structure/property type that best reflects the observed use.
	Not residential, developed	
	Not residential, undeveloped/no structures	
	Unknown	Select unknown if you drive by and see an orange parcel with a visible address sign but cannot see the residential structure from the roadside.
Gate (<i>gate</i>) – In-field assessments only <i>Locked gates restrict emergency responders to safely defend a structure in the event of a wildfire.</i>		
Is there a gate that blocks access the property?	No gate present	Denote whether there is a gate that blocks access to the property (yes/no – does not matter if it is locked or not). If there are two clear driveways and only one has a gate, select “gate present”.
	Gate present	
	Unknown – not observed	If you cannot observe the attribute at all, choose "Unknown - not observed."
Comments (<i>comments</i>)		
Open field for any assessor comments (ex. home currently being built, more than one residential structure).		

Table 2. Risk attributes related to home ignition potential

Risk attribute (<i>variable name</i>)	Response categories	Score	Attribute measurement suggestions
Roof (roof) <i>The roof plays a major role in the vulnerability of the home to fire, particularly airborne embers, which can burn through roofing.</i>			
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. 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 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 2. Risk attributes related to home ignition potential

Risk attribute (<i>variable name</i>)	Response categories	Score	Attribute measurement suggestions
Siding (<i>siding</i>) <i>After the roof, the exterior siding represents the second largest surface that is exposed to potential ignition risks.</i> <i>This is probably the most challenging domain to assess during the Rapid Assessment, for many reasons including 1) there are dozens of commonly used siding materials, many of which claim to be ignition resistant 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.</i> <i>It is up to the assessor to identify the most vulnerable exterior siding material, even if it constitutes a small portion of the total.</i>			
What is the most vulnerable exterior siding material?	Stucco, cement, brick, stone, or other non-combustible siding	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.
	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 2. Risk attributes related to home ignition potential

Risk attribute (<i>variable name</i>)	Response categories	Score	Attribute measurement suggestions
Combustible attachments (<i>attach</i>) <i>Decks, fences, and other attachments are well known to be considerable sources of home ignition vulnerability.</i>			
Does the home have a combustible balcony, deck, porch, or fence attached to the structure?	No combustible attachments	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.
	Combustible attachments present	100	While composite decking boards (ex. Trex) are considered by many to be a better alternative than standard decking boards, this risk assessment categorizes composite decking as "combustible."
	Unknown - not observed	100	If you cannot observe the attribute at all, choose "Unknown - not observed."
Distance to adjacent homes (<i>closehome</i>) <i>Home to home ignitions (i.e., conflagration) are a significant factor in the spread of fire through more densely built environments.</i>			
What is the closest distance to a neighboring home?	More than 100'	0	When assessing the home, determine the distance to the nearest neighboring 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."

Table 3. Risk attributes related to defensible space

Risk attribute (<i>variable name</i>)	Response categories	Score	Attribute measurement suggestions
Distance to overgrown vegetation (0 – 100 ft) (<i>dspace</i>) <i>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 <u>radiant</u> 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).</i>			
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 <i>particular</i> 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? If you cannot observe the attribute at all, choose "Unknown - not observed."
	30' - 100'	50	
	5' - 29'	75	
	Less than 5'	100	
	Unknown - not observed	100	

Table 3. Risk attributes related to defensible space

Risk attribute (<i>variable name</i>)	Response categories	Score	Attribute measurement suggestions
Distance to other combustibles (non-vegetation) (<i>combustibles</i>) <i>Other combustibles are extremely common. These materials represent a risk, particularly related to ember ignition exposure.</i>			
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?	More than 30' or no combustible items	0	Are there any other combustible materials that a structure triage group (group responsible for deciding how defensible a home is and what firefighter efforts would need to include) 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, outbuildings, sheds, detached garages, lumber, construction materials, firewood, propane tanks, hay bales, leaves, wicker furniture, or decorative ornaments.
	5' - 30'	40	
	Less than 5'	80	
	Unknown - not observed	80	If you cannot observe the attribute at all, choose "Unknown - not observed."

Table 4. Risk attributes related to background conditions

Risk attribute (<i>variable name</i>)	Response categories	Score	Attribute measurement suggestions
Distance to dangerous topography (<i>topo</i>) <i>Topography is one of three main factors that influence wildland fire behavior. 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.</i>			
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 proximity of the home to topographical features that can increase fire behavior. This is specifically regarding topographic features like ridges, steep drainages, or narrow canyons. This does not include the home being on a steep slope, which will be assessed with the "slope" attribute.
	50' - 150'	25	
	Less than 50'	50	
	Unknown - not observed	50	If you cannot observe the attribute at all, choose "Unknown - not observed."

Table 4. Risk attributes related to background conditions

Risk attribute (<i>variable name</i>)	Response categories	Score	Attribute measurement suggestions
Slope (<i>slope</i>) <i>The overall slope of the land where the home is situated has a significant influence on how wildfire will likely behave. As slope increases, the potential for elevated fire behavior characteristics increases as well.</i>			
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.
	Moderate: 20% - 45%	10	To maintain consistency for in-field assessments, we recommend that each assessor utilize the same methodology for estimating slope. If the slope varies across the property, do your best to make an estimate of the overall lay of the land within approximately 150 feet of the home.
	Steep: greater than 45%	20	PLEASE NOTE THE DIFFERENCE BETWEEN PERCENT SLOPE AND DEGREES.
	Unknown - not observed	20	If you cannot observe the attribute at all, choose "Unknown - not observed."

← "Steep" rating

"Moderate" rating →

← "Gentle" rating →

Slope = 100%

Rise

300 ft

90°

45°

300 ft

Run

— = $\frac{300}{300}$ = 100%

Slope = 45%

135 ft

300 ft

42°

— = $\frac{135}{300}$ = 45%

Slope = 20%

60 ft

300 ft

20°

— = $\frac{60}{300}$ = 20%

Slope = 0%

0 ft

300 ft

— = $\frac{0}{300}$ = 0%

Table 4. Risk attributes related to background conditions

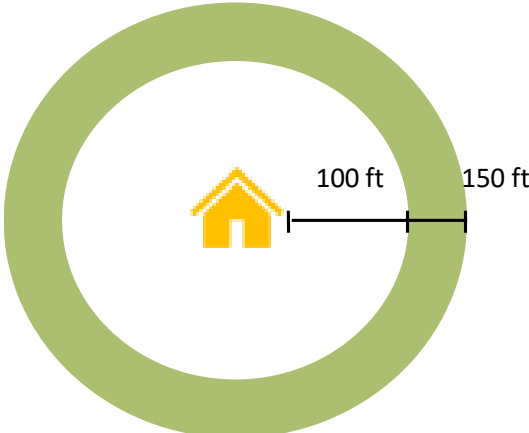
Risk attribute (<i>variable name</i>)	Response categories	Score	Attribute measurement suggestions
Adjacent fuels (100 – 150 ft) (<i>adjfuels</i>) <i>This attribute is a proxy for fuel type and fuel load/density. It does not necessarily analyze factors related to fuel conditions that are critical to understanding 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 representative of the fuels and is likely subject to some degree of assessor interpretation.</i>			
Which of the following best describes the dominant vegetation 100' - 150' from the home? <i>This may be outside the property boundary.</i>	Light: Grasses with less than 1' accumulated dead material or hardwood stand (e.g., birch, aspen, alder, cottonwood) without spruce and without a dense understory	10	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.
	Medium: Isolated shrubs/trees or mixed hardwood/spruce stand without a dense understory	20	To assess this, we recommend considering: 1) vertical density (ladder fuels), 2) horizontal density (spacing of vegetation), and 3) fuel type (e.g., coniferous vs. deciduous). 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.
	Dense: Dense spruce stand or mixed hardwood/spruce stand with dense understory (e.g., small spruce, dead grasses, thick lichen)	40	
	Unknown - not observed	40	If you cannot observe the attribute at all, choose "Unknown - not observed."
			

Table 4. Risk attributes related to background conditions

Risk attribute (<i>variable name</i>)	Response categories	Score	Attribute measurement suggestions
Adjacent fuels (100'-150') response category examples			
	Light	Medium	Dense

Table 5. Risk attributes related to access

Risk attribute (<i>variable name</i>)	Response categories	Score	Attribute measurement suggestions
Address posting (<i>address</i>) – In-field assessments only <i>A clearly visible address sign, that remains visible in the dark (e.g., night, smoky) is critical for safe and effective emergency response. Assessors should note *all* the standards to determine which response to select.</i>			
Does the address sign meet the standards? - Numbers 3" high - Numbers on contrasting background - Durable material - Visible from road - Reflective	Fully meets standards	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.
	Unknown - not observed	10	If you cannot observe the attribute at all, choose "Unknown - not observed."
Ingress/Egress (<i>roads</i>) <i>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 which would constitute only one way in/out.</i>			
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 there are two ways to leave the community from the end of the property's driveway, which would allow evacuation to occur in two or more directions. For example, at the end of the driveway there are two different roads that can get to the highway.
	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 5. Risk attributes related to access

Risk attribute (<i>variable name</i>)	Response categories	Score	Attribute measurement suggestions
Driveway clearance (<i>drivewayclr</i>) <i>Driveway clearance is critical for access to the property by wildland fire engines, structure fire apparatus, and other emergency responders. Ideally, 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 through. Assessors should note *both* the standards to determine which response to select.</i>			
Does the driveway meet the following clearance standards: - At least 13.5' height - At least 20' width	Meets both 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. The horizontal standard for this assessment is 20 feet. For example, if the 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	However, if there are obstructions, such as vegetation, driveway gateways or anything else that would make it difficult or impossible to access the home, at any point, then the assessor should rate this domain as either "Meets one, but not both, standards (height or width)" or "Does not meet either standard (height and width)" depending on an observational estimate of the width of the driveway.
	Does not meet either standard (height or width)	10	
	Unknown - not observed	10	If you cannot observe the attribute at all, choose "Unknown - not observed."

Table 5. Risk attributes related to access

Risk attribute (<i>variable name</i>)	Response categories	Score	Attribute measurement suggestions
Driveway length (<i>drivewayl</i>) <i>The longer the driveway, the more risk exposure for responders and the less likely that they will choose to access the property during a wildfire.</i>			
What best describes the driveway?	Less than 150' long with "adequate" turnaround	0	In the field, length should be visually estimated (do NOT drive down the driveway). "Adequate" is considered in the context of a Type 1 fire engine (classic large fire engine).
	Less than 150' long without "adequate" turnaround	0	
	150' or more with "adequate" turnaround	5	
	150' or more without "adequate" turnaround	10	
	Unknown - not observed	10	If you cannot observe the attribute at all, choose "Unknown - not observed."

Table 6. Community-specific information

Attribute (<i>variable name</i>)	Response categories	Attribute measurement suggestions
Driveway steepness (<i>driveways</i>) <i>Driveway steepness affects firefighter's ability to access a property during an event. Considering slope alone and with all other driveway access attributes being accessible, a 10% slope is the maximum steepness accessible for 2WD Type 1 vehicle, and 20% slope requires a 4WD vehicle.</i>		
What is the slope of the driveway?	Less than 10%	Slope is a measurement of the vertical rise between at least two points. If the slope varies across the driveway, record the slope of the steepest section if that section is 5' long or more.
	10% to 20%	
	Greater than 20%	To maintain consistency during in-field assessments, we recommend that each assessor utilize the same methodology for estimating slope.
	Unknown - not observed	If you cannot observe the attribute at all, choose "Unknown - not observed."

3 Rapid Assessment Scoring

WiRē Rapid Assessment Scoring Guide

	Risk attribute	Response categories	Attribute weight	Category score
Home ignition potential	Roof	Tile, metal, or asphalt shingles	30%	0
		Wood (shake shingles)		300
	Siding	Stucco, cement, brick, stone, or other noncombustible siding	7%	0
		Log or heavy timbers		35
		Wood or vinyl siding		70
	Combustible attachments	No combustible attachments	10%	0
		Combustible attachments present		100
	Distance to adjacent homes	More than 100'	20%	0
		30' - 100'		50
		10' - 29'		100
		Less than 10'		200

Defensible space	Distance to overgrown vegetation (0' - 100')	More than 100'	10%	0
		30' - 100'		50
		5' - 29'		75
		Less than 5'		100
	Distance to other combustibles (non-vegetation)	More than 30' or no combustible items	8%	0
		5' - 30'		40
		Less than 5'		80

Risk rating	Low	20	260
	Moderate	261	325
	High	326	455
	Very high	456	540
	Extreme	541	1000

	Risk attribute	Response categories	Attribute weight	Category score
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: 20% - 45%		10
		Steep: Greater than 45%		20
	Adjacent fuels (100' - 150')	Light	4%	10
		Medium		20
		Dense		40

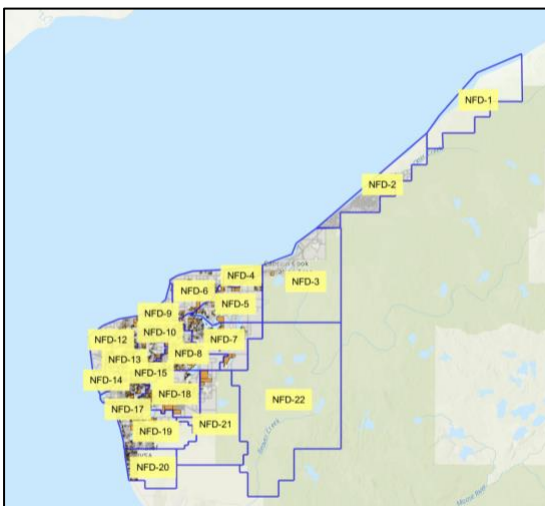
Access	Address posting	Fully meets standard	1%	0
		Visible, but does not meet all standards		5
		Not posted/visible from the primary road		10
	Ingress/Egress	Two or more roads in/out	1%	0
		One road in/out		10
	Driveway clearance	Meets both standards (height and width)	1%	0
		Meets one, but not both, standards (height or width)		5
		Does not meet either standard (height or width)		10
	Driveway length	Less than 150' long with "adequate" turnaround	1%	0
		Less than 150' long without "adequate" turnaround		0
		150' or more with "adequate" turnaround		5
		150' or more without "adequate" turnaround		10

1 Nikiski and Cooper Landing Rapid Assessment

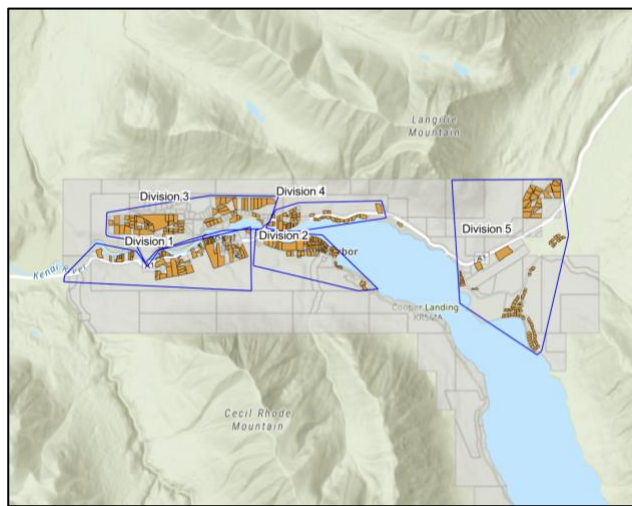
Instructions for Using ArcGIS Field Maps

Before starting the WiRē rapid wildfire risk assessments, it's important to remember the strong tie between the rapid assessment and 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 rapid assessment is to assess all parcels with residential structures in the study area, which comprise approximately 2,655 residential parcels in Nikiski¹ and 350 residential parcels in Cooper Landing. These parcels are indicated on the maps below in solid orange. The blue boundary lines represent the different assignment areas.



Nikiski Study Area



Cooper Landing Study Area

¹ There are 105 additional residential structures in Nikiski that will not be assessed in the field due to accessibility and safety concerns. In lieu of the in-field rapid assessment, WiRē will conduct remote assessments.

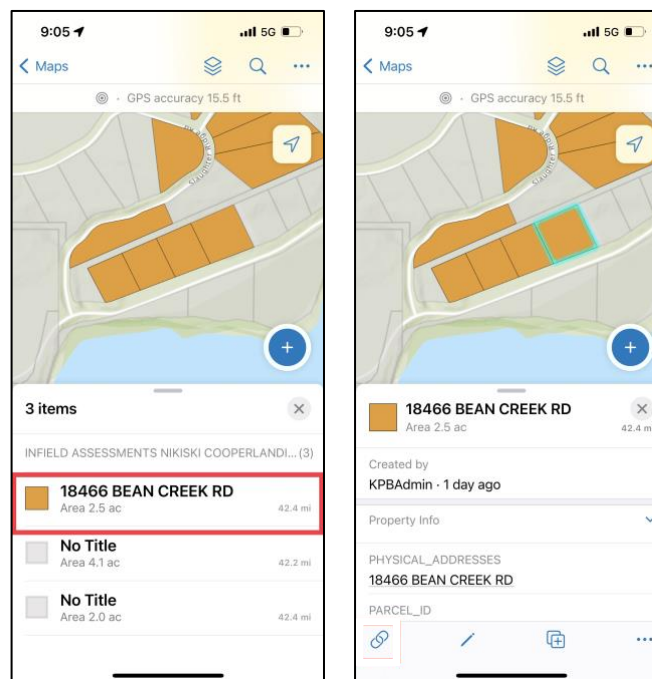
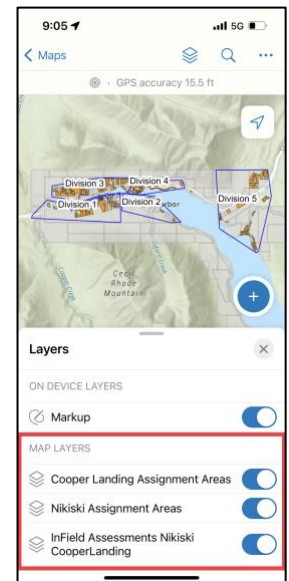
1.1 How to access the data collection app



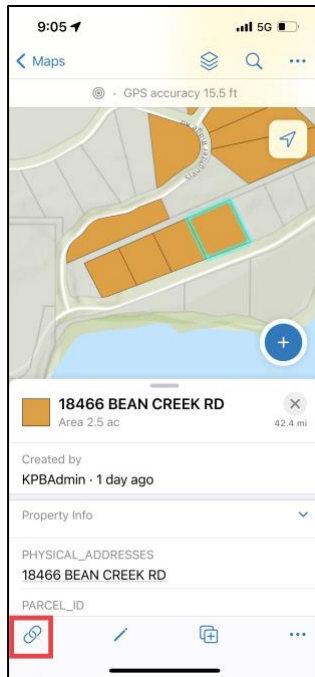
1. Download ArcGIS Field Maps onto your tablet or other device.
2. Log into the app using your personal username and the following password:
 - a. Volunteer@wire321
3. Select the map called wr024_InField_RA
 - a. To zoom into the Nikiski study area, click the layers button and click "Nikiski Assignment Areas".
 - b. To zoom into the Cooper Landing study area, click the layers button and click "Cooper Landing Assignment Areas"

1.2 How to access the rapid assessment data form

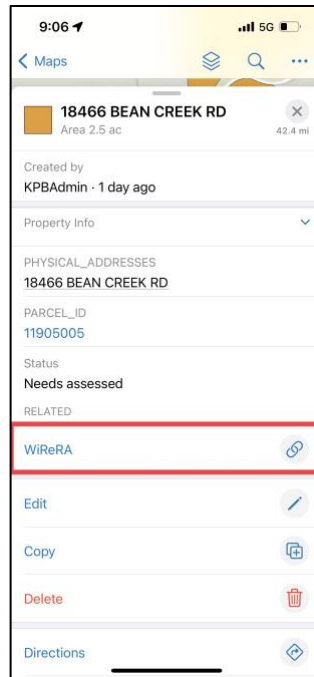
1. Open Field Maps.
2. You will only assess orange parcels, which have been identified as residential. If you pass a gray parcel on your way to get to an orange parcel that has a residence on it, please stop and conduct an assessment using the same directions as below. Do not go out of your way to check every gray parcel.
3. Select an orange polygon, and a sidebar will pop up. Select the orange polygon.



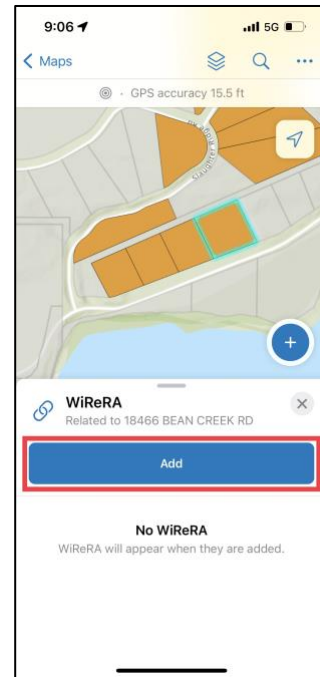
4. There are two ways to access the rapid assessment form.
 - a. Option 1: At the bottom of your phone/device, you will see a symbol that looks like two linked chains. Select that to collect data for the parcel. Then click the blue “Add” button.
 - b. Option 2: Scroll down and select “WiReRA.” Then click the blue “Add” button.



Option 1



Option 2



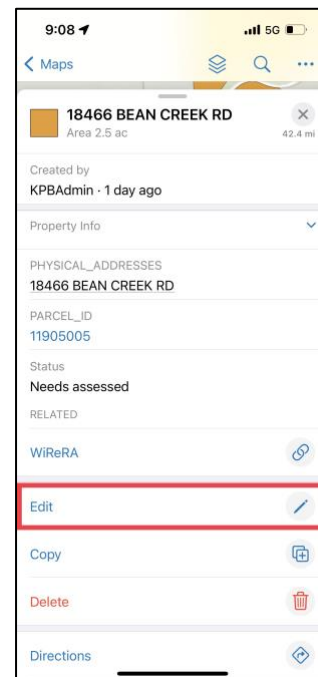
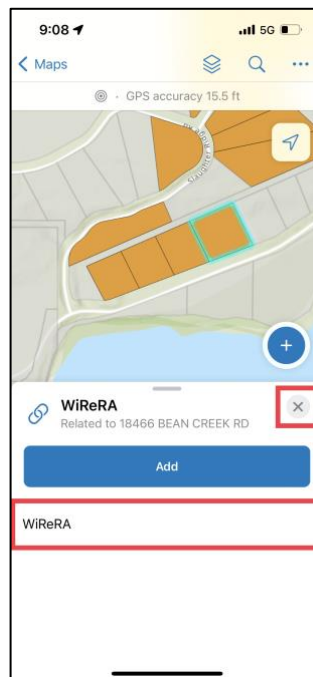
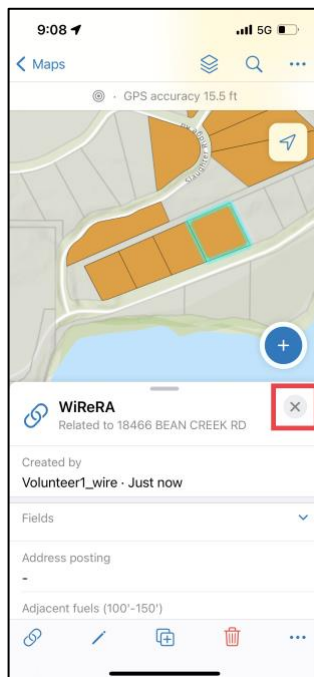
Add button

5. Fill out the form following protocols outlined in the Assessor Reference Guide.
 - a. If you are not able to tell if the parcel is residential, do not complete an assessment and edit the status to “cannot complete” as described under step 7.

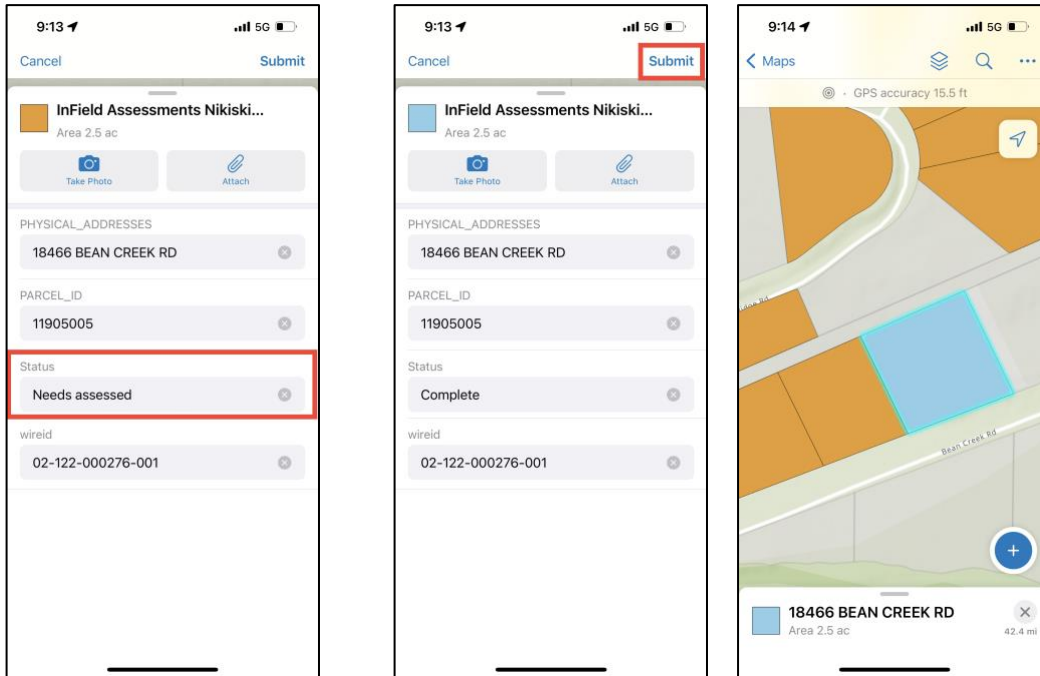
6. When done filling out the form, click submit in top, right-hand corner (android will show a checkmark).

A screenshot of a mobile app interface for submitting a form. At the top, there are 'Cancel' and 'Submit' buttons. The 'Submit' button is highlighted with a red box. Below the buttons, the form contains several sections with dropdown menus: 'Structure type' (Residential), 'Gate' (No gate present), 'Roof' (Tile, metal, or asphalt shingles), 'Siding' (Wood or vinyl), and 'Combustible attachments' (Unknown-not observed). There are also text input fields for 'Comments' and 'Distance to adjacent homes'.

7. We need you to take several more steps to call it complete/change the symbology.
 - a. Click on the X. Click on the X again. Note: you should see the words “WiReRA” to indicate your rapid assessment form was submitted.
 - b. Then click on the edit button.



- c. Scroll down to Status, click on the drop-down, and select “Complete”, then click Submit. The parcel should change from orange to blue. **Do NOT click the “Add Point” button.**
 - i. Change status to “Cannot complete” if it is unsafe to conduct an assessment, or if you cannot conduct an assessment from the road.



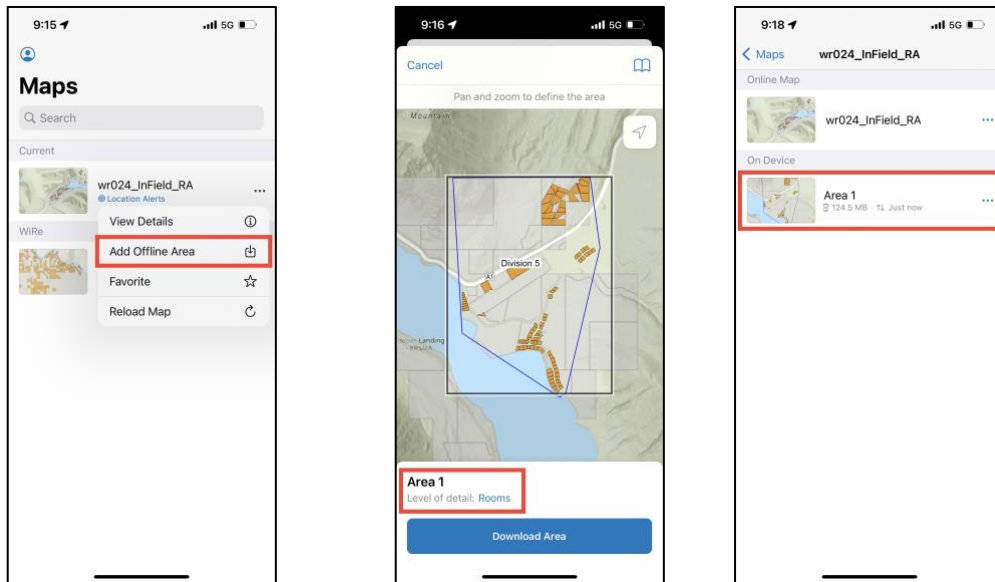
1.3 What to do when there are multiple structures on a property

1. Some parcels might have multiple structures on them. Please complete a separate WiReRA for **all** residential structures on a property. To do this, assess the main residential structure first.
2. To assess another residential structure on the same parcel, select the same parcel in Field Maps again and follow the same procedures in Section 1.2. 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.’

1.4 How to add an off-line area

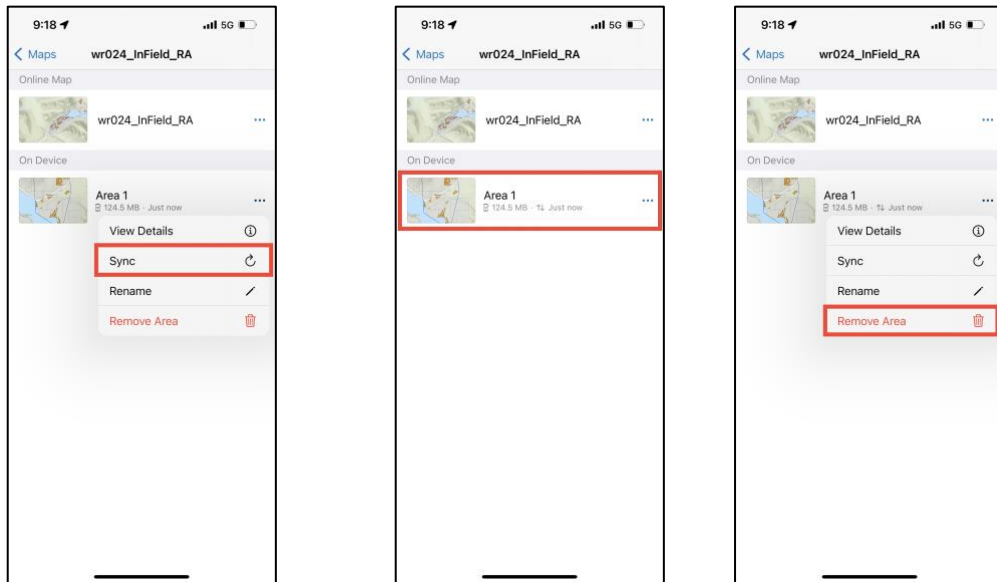
1. From the main screen in Field Maps, select the three dots next to the “wr024_InField_RA” and select “Add Offline Area”

2. Move the box over the area where you will conduct the rapid assessments. You may need to set the level of detail to fit the scale. In the example below, I selected “Rooms” to capture all of Division 5 in Cooper Landing. Then select “Download Area”. It may take some time to fully download. I had the best luck at the front of the fire station. Once the area is downloaded, you can go collect the data.



1.5 How to sync after being off-line?

1. When you have finished for the day, return to a place where you have WiFi to sync your work.
2. Go the map screen, select the three dots next to the offline area you created, and then select “Sync.”
3. You will know it has synced because the time will update. Right after you sync, it should say “Just Now”.
4. 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.



1.6 What to do with multi-unit attached structure (ex., duplex, condos, apartment buildings) embedded in one white polygon

1. 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.
2. When you have submitted the rapid assessment and select “Complete” then the unit will turn blue, not the entire polygon.

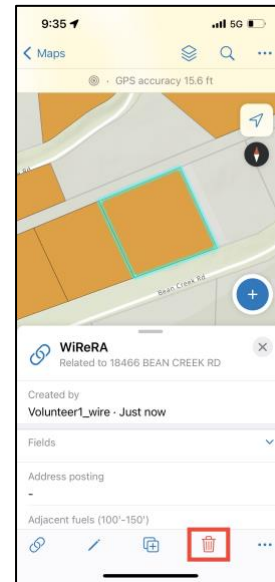
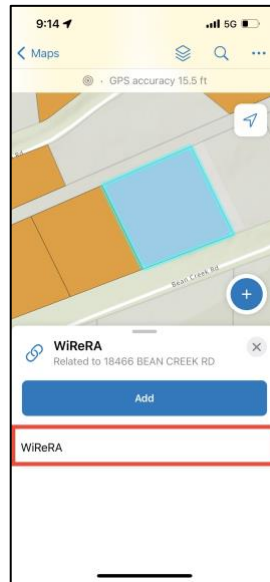
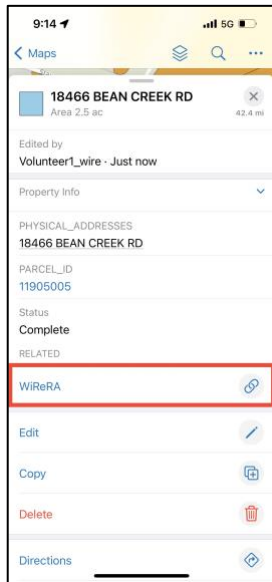
1.7 How to delete rapid assessment data, should you need to

1. While this should not happen often, there may be an instance where you need to delete the rapid assessment data associated with a parcel. To do this, select the parcel and click the link for WiReRA.

Note: Do NOT click the button that says “Delete” in red font next to the trashcan. This will delete the parcel.

2. Then you will see a screen with a link to the rapid assessment form called “WiReRA”. Click on “WiReRA”. Do NOT click add point!
3. Then you will see a screen with the rapid assessment data you collected. You will see the chain link with the words “WiReRA” and “related to...” on the screen. This means you are looking at the data you entered in the form. To delete the rapid assessment

data, click on the red trashcan data on the bottom and confirm you want to delete the feature.



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

Begins on next page.

The Cooper Landing Rapid Assessment Summary

Cooper Landing Emergency Services conducted parcel-level rapid wildfire risk assessments in 2023. Risk assessment data collection was collected as a census of all residential properties with a structure in the study area¹. The rapid wildfire risk assessments were conducted for 297 residential structures on 288 parcels using the standard WiRē Rapid Wildfire Risk Assessment (RA). The WiRē RA 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 WiRē RA is evaluated relative to other private land parcels within the study area. As a result, the WiRē 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 WiRē 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. Additionally, data were collected on three non-scored attributes: gate, driveway steepness, and community egress.

To ensure consistent, high quality data collection WiRē 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 Cooper Landing Emergency Services 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

¹ Kenai Peninsula Borough Assessor data from February 2023 was used as the underlying dataset to collect data.

**This research was supported, in part, by the U.S. Department of Agriculture, Washington Office Fire and Aviation Management; and the Bureau of Land Management, Wildland Fire Community Assistance Program. This research received in-kind support from the USDA Forest Service, Rocky Mountain Research Station; the Bureau of Land Management; the University of Colorado, Institute for Behavioral Sciences; the U.S. Geological Survey; the Kenai Peninsula Borough Office of Emergency Management; and Cooper Landing Emergency Services and Chugach National Forest. The household survey administration was paid for by the National Science Foundation funded project: Socio-ecological considerations for sustainAble Fuel treatments to Reduce wildfire Risk (SAFRR).*

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

**Document prepared 1/22/24*

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.

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 first table presents the results of the overall wildfire risk rating, which is the sum of the attribute scores (Section 1.1). The next 13 tables present a summary of the Cooper Landing Emergency Services’ responses to the 13 risk attributes in the WiRē RA (Section 1.2 through 1.5). Additionally, Cooper Landing Emergency Services collected data on two non-scored attributes: gate and driveway steepness. Section 1.6 presents the results of those two attributes. The percentages might not add to 100% due to rounding.

1.1 Overall risk rating

Overall risk rating: Based on the sum of the 13 attribute scores.				
Response categories	Score range	Number (N=297)	% of all RAs in study area	
Low	20-250	9	3%	
Moderate	251-325	30	10%	
High	326-455	166	56%	
Very high	456-540	32	11%	
Extreme	541-1000	60	20%	

1.2 Home ignition potential

Risk attribute: Roof (30% of total rapid assessment score) What is the most vulnerable roofing material?				
Response categories	Score	Number (N=297)	% of all rapid assessments in study area	
Tile, metal, or asphalt shingles	0	246	83%	
Wood (shake shingles)	300	51	17%	
*Out of all rapid assessments in the study area, 34 were missing/unobserved (11%) and included in the highest risk category.				

Risk attribute: Siding (7% of total rapid assessment score) What is the most vulnerable exterior siding material?				
Response categories	Score	Number (N=297)	% of all rapid assessments in study area	
Stucco, cement, brick, stone, or other noncombustible siding	0	2	1%	
Log or heavy timbers	35	33	11%	
Wood or vinyl siding	70	262	88%	
*Out of all rapid assessments in the study area, 23 were missing/unobserved (8%) and included in the highest risk category.				

Risk attribute: Combustible attachments (10% of total rapid assessment score) Does the home a combustible balcony, deck, or fence attached to the structure?				
Response categories	Score	Number (N=297)	% of all rapid assessments in study area	
No combustible attachments	0	16	5%	
Combustible attachments present	100	281	95%	
*Out of all rapid assessments in the study area, 71 were missing/unobserved (24%) and included in the highest risk category.				

Risk attribute: Distance to adjacent homes (20% of total rapid assessment score) What is the closest distance to a neighboring home?				
Response categories	Score	Number (N=297)	% of all rapid assessments in study area	
More than 100'	0	209	70%	
30' - 100'	50	60	20%	
10' - 29' away	100	4	1%	
Less than 10'	200	24	8%	
*Out of all rapid assessments in the study area, 23 were missing/unobserved (8%) and included in the highest risk category.				

1.3 Defensible space

Risk attribute: Distance to overgrown vegetation (0 – 100 ft) (10% of total rapid assessment score) What is the closest distance from the home to overgrown, dense, or unmaintained vegetation?				
Response categories	Score	Number (N=297)	% of all rapid assessments in study area	
More than 100'	0	4	1%	
30' - 100'	50	39	13%	
5' - 29'	75	118	40%	
Less than 5'	100	136	46%	
*Out of all rapid assessments in the study area, 60 were missing/unobserved (20%) and included in the highest risk category.				

Risk attribute: Distance to other combustibles (non-vegetation) (8% of total rapid assessment 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=297)	% of all rapid assessments in study area	
More than 30' or no combustible items	0	15	5%	
5' - 30'	40	85	29%	
Less than 5'	80	197	66%	
*Out of all rapid assessments in the study area, 64 were missing/unobserved (22%) and included in the highest risk category.				

1.4 Background conditions

Risk attribute: Distance to dangerous topography (5% of total rapid assessment score) What is the closest distance from the home to a ridge, steep drainage, or narrow canyon?				
Response categories	Score	Number (N=297)	% of all rapid assessments in study area	
More than 150'	0	232	78%	
50' - 150'	25	48	16%	
Less than 50'	50	17	6%	
*Out of all rapid assessments in the study area, 10 were missing/unobserved (3%) and included in the highest risk category.				

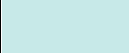
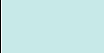
Risk attribute: Slope (2% of total rapid assessment score) The slope of a property refers to the steepness of the land. A large property may have steep, moderate, and gentle slopes. How would you describe the slope of the property within 150' of the home?				
Response categories	Score	Number (N=297)	% of all rapid assessments in study area	
Gentle - Less than 20%	0	147	49%	
Moderate - Between 20% and 45%	10	116	39%	
Steep - Greater than 45%	20	34	11%	
*Out of all rapid assessments in the study area, 8 were missing/unobserved (3%) and included in the highest risk category.				

Risk attribute: Adjacent fuels (100 - 150 ft) (4% of total rapid assessment 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=297)	% of all rapid assessments in study area	
Light	10	3	1%	
Medium	20	21	7%	
Dense	40	273	92%	
*Out of all rapid assessments in the study area, 3 were missing/unobserved (1%) and included in the highest risk category.				

1.5 Access

Risk attribute: Address posting (1% of total rapid assessment score) Does the address sign meet all local standards (Posted location, reflective, size, contrasting, non-combustible materials)				
Response categories	Score	Number (N=297)	% of all rapid assessments in study area	
Fully meets standard	0	62	21%	
Address sign is visible, but does not meet all standards	5	123	41%	
Not posted/visible from the primary road	10	112	38%	
*Out of all rapid assessments in the study area, 4 were missing/unobserved (1%) and included in the highest risk category.				

Risk attribute: Ingress/egress (1% of total rapid assessment 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=297)	% of all rapid assessments in study area	
Two or more roads in/out	0	63	21%	
One road in/out	10	234	79%	
*Out of all rapid assessments in the study area, 5 were missing/unobserved (2%) and included in the highest risk category.				

Risk attribute: Driveway clearance (1% of total rapid assessment score)				
Does the driveway meet the horizontal and vertical clearance standards: height at least 20' and width at least 13.5'?				
Response categories	Score	Number (N=297)	% of all rapid assessments in study area	
Meets all driveway standards	0	86	29%	
Meets one, but not both, standards	5	117	39%	
Does not meet either standard	10	94	32%	
*Out of all rapid assessments in the study area, 5 were missing/unobserved (2%) and included in the highest risk category.				

Risk attribute: Driveway length (1% of total rapid assessment score)				
What best describes the driveway?				
Response categories	Score	Number (N=297)	% of all rapid assessments in study area	
Less than 150' long	0	141	47%	
150' or more with "adequate" turnaround	5	27	9%	
150' or more without "adequate" turnaround	10	129	43%	
*Out of all rapid assessments in the study area, 24 were missing/unobserved (8%) and included in the highest risk category.				

1.6 Unsourced attributes

Attribute: Gate (Not scored)				
Does the property have a gate?				
Response categories	Score	Number (N=297)	% of study area	
No gate present	-	240	81%	
Gate present	-	57	19%	
*Out of all records in the study area, 2 were missing/unobserved (1%) and included in the highest risk category.				

Attribute: Driveway steepness (Not scored) What best describes the driveway?				
Response categories	Score	Number (N=297)	% of study area	
Less than 10%	-	196	66%	
10%-20%	-	66	22%	
Greater than 20%	-	35	12%	
*Out of all records in the study area, 4 were missing/unobserved (1%) 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.

Cooper Landing Rapid Assessment Compared to Household Survey Responses

Trained assessors from Cooper Landing Emergency Services conducted parcel-level rapid wildfire risk assessments in 2023 and administered a household survey in 2024. 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 123 properties for which we have a rapid assessment paired with household survey. There are an additional 174 properties with only a rapid assessment, for a total of 297 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, in part, by the U.S. Department of Agriculture, Washington Office Fire and Aviation Management; and the Bureau of Land Management, Wildland Fire Community Assistance Program. This research received in-kind support from the USDA Forest Service, Rocky Mountain Research Station; the Bureau of Land Management; the University of Colorado, Institute for Behavioral Sciences; the U.S. Geological Survey; the Kenai Peninsula Borough Office of Emergency Management; and the Cooper Landing Emergency Services and Chugach National Forest. The household survey administration was paid for by the National Science Foundation funded project: Socio-ecological considerations for sustainAble Fuel treatments to Reduce wildfire Risk (SAFRR).*

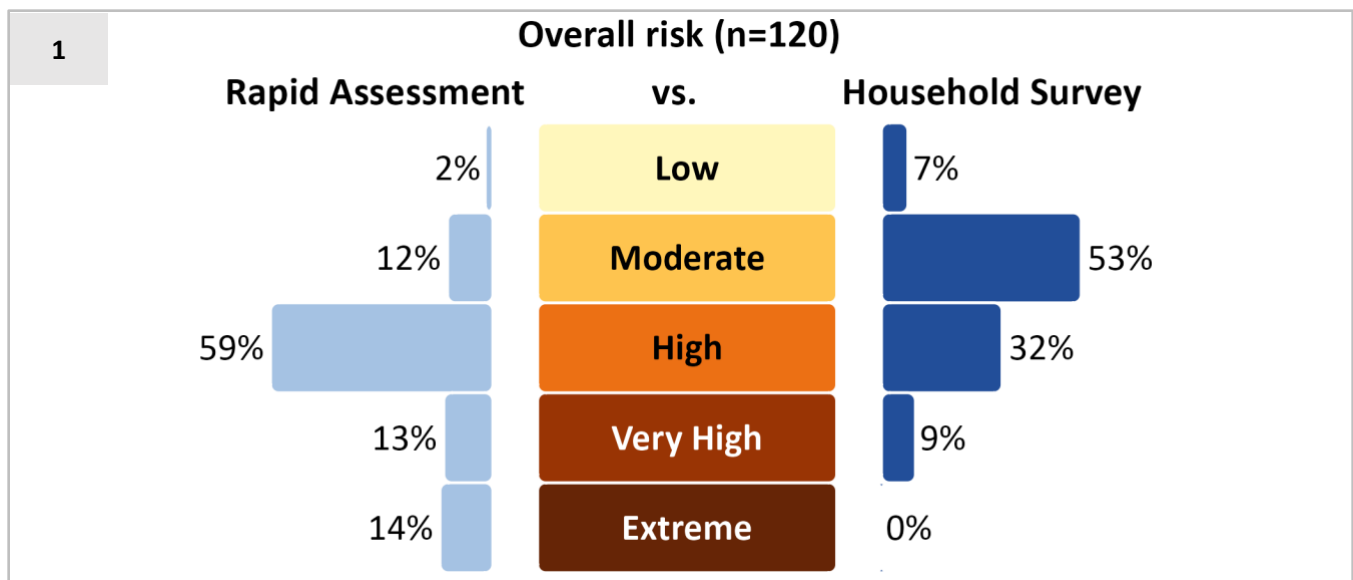
**All data received and processed as of June 18, 2024*

**Document prepared June 24, 2024*

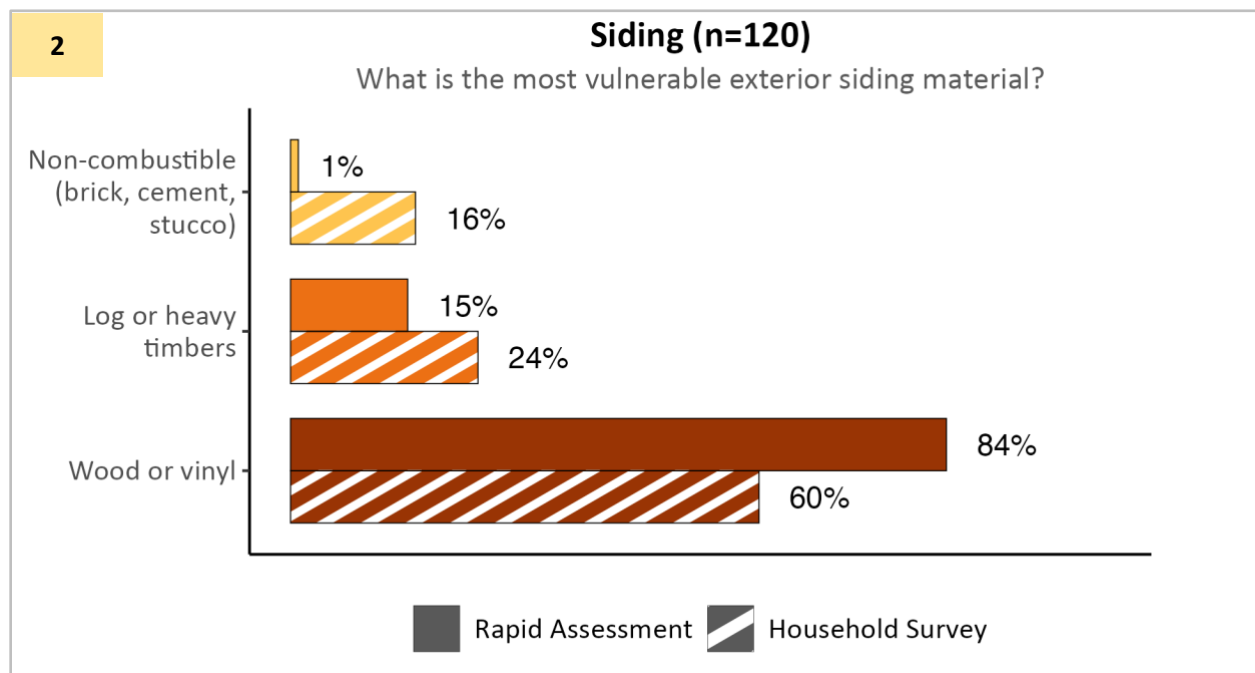
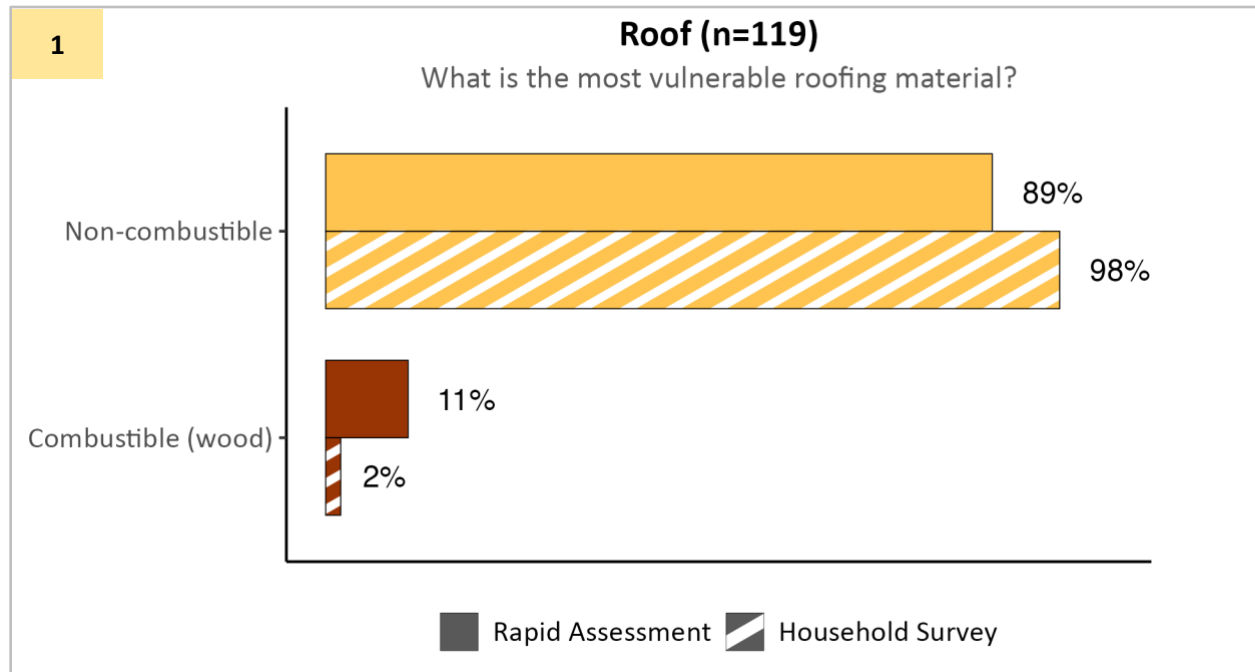
1. Comparison of paired WiRē Rapid Assessment vs. Household Survey

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



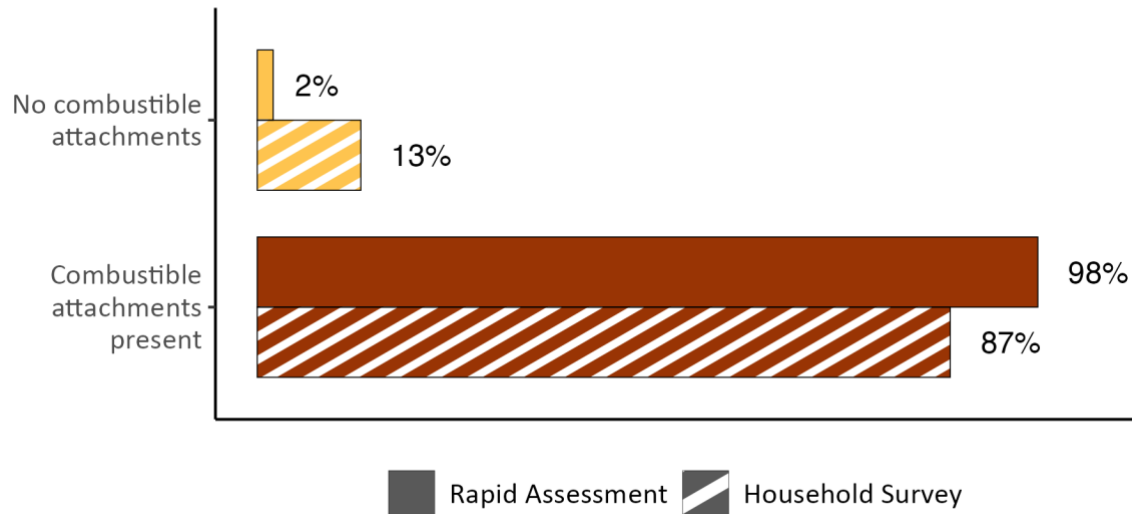
1.2 Home ignition potential



3

Combustible attachments (n=120)

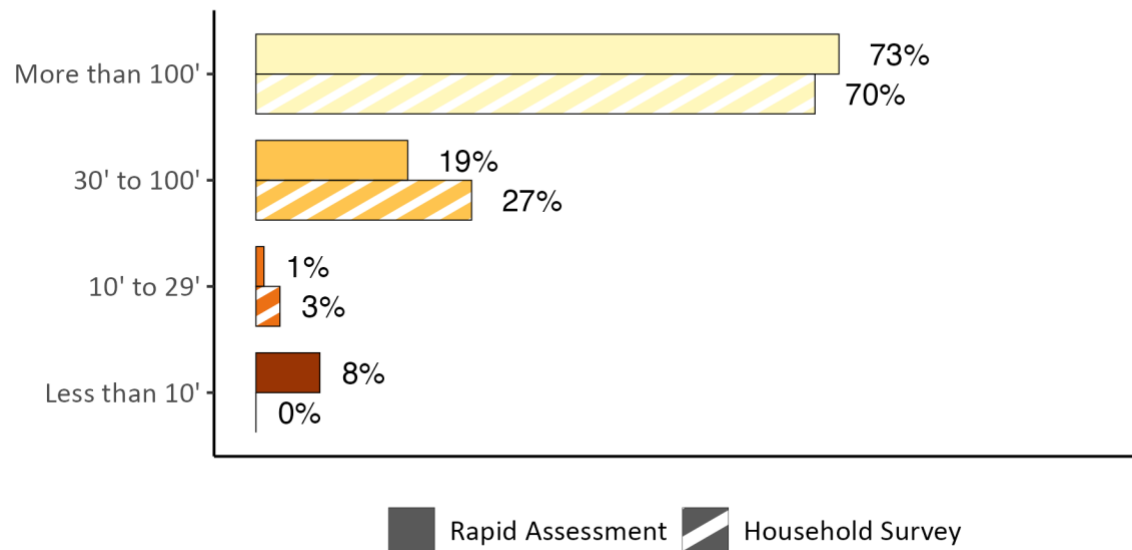
Does the home have a combustible balcony, deck, or fence attached to the structure?



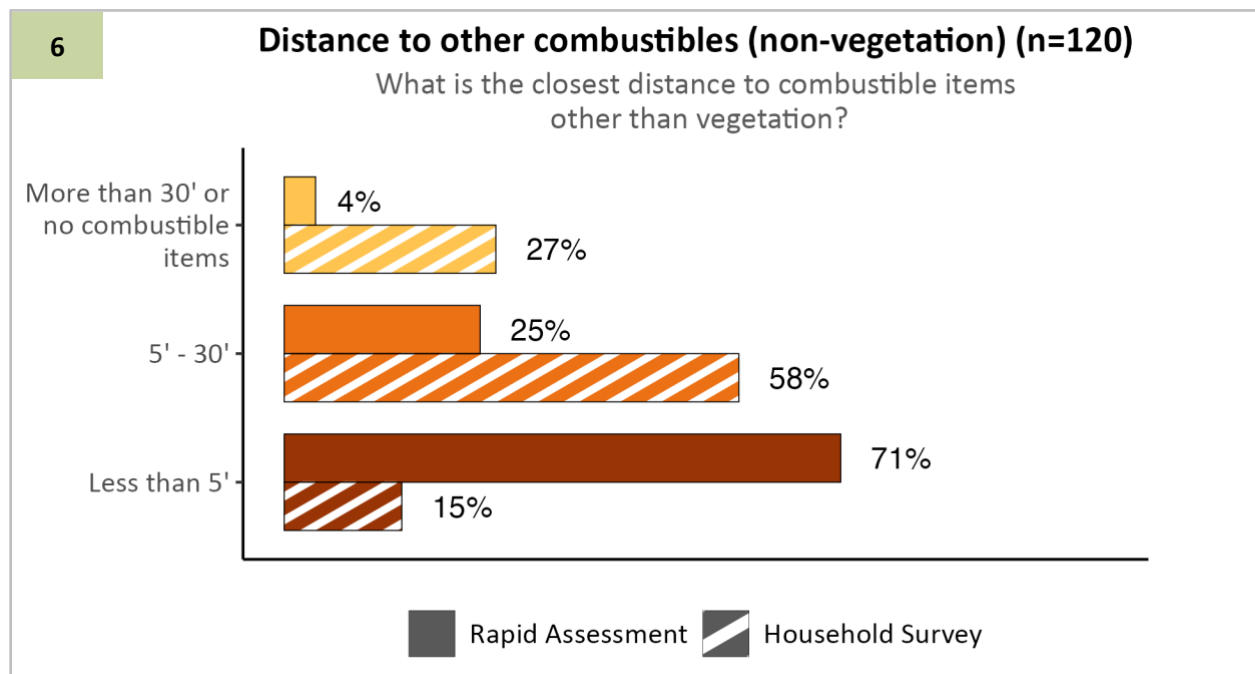
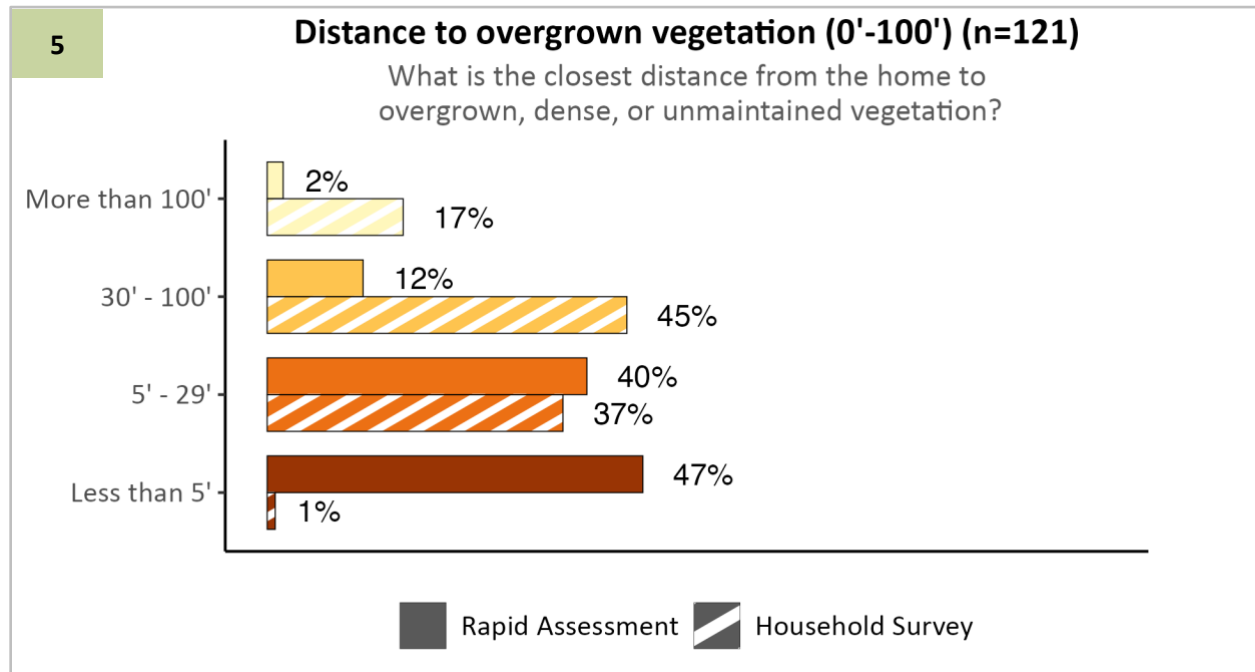
4

Distance to adjacent homes (n=120)

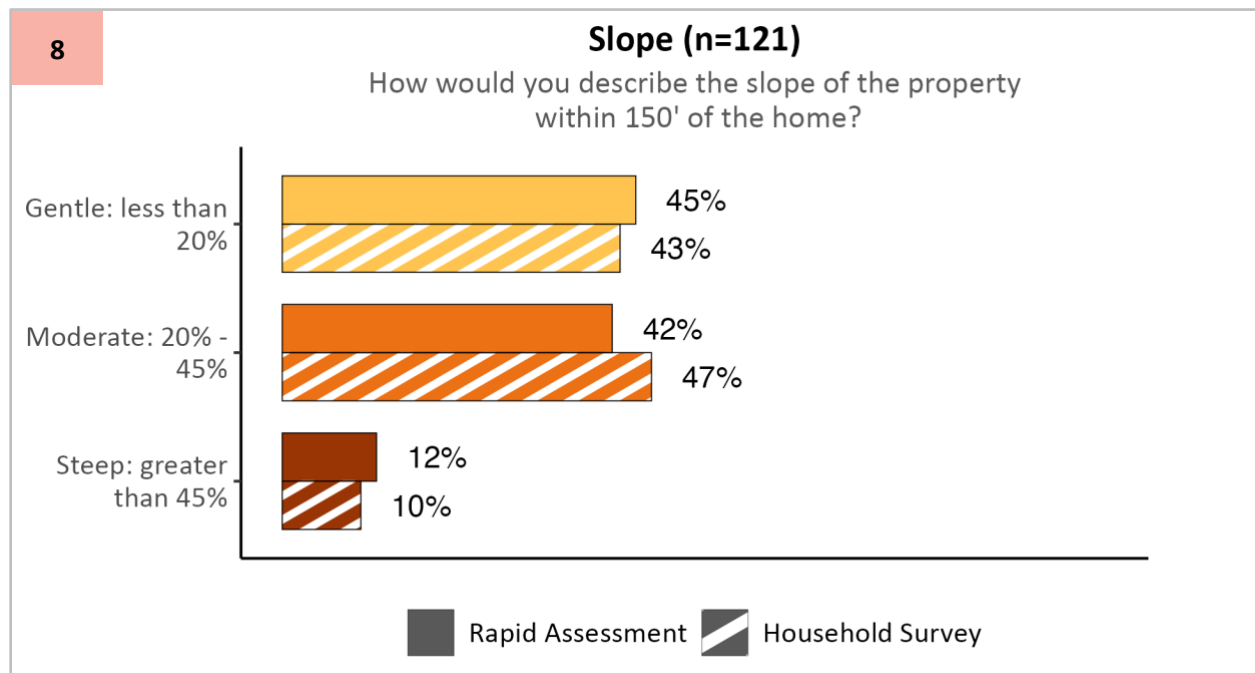
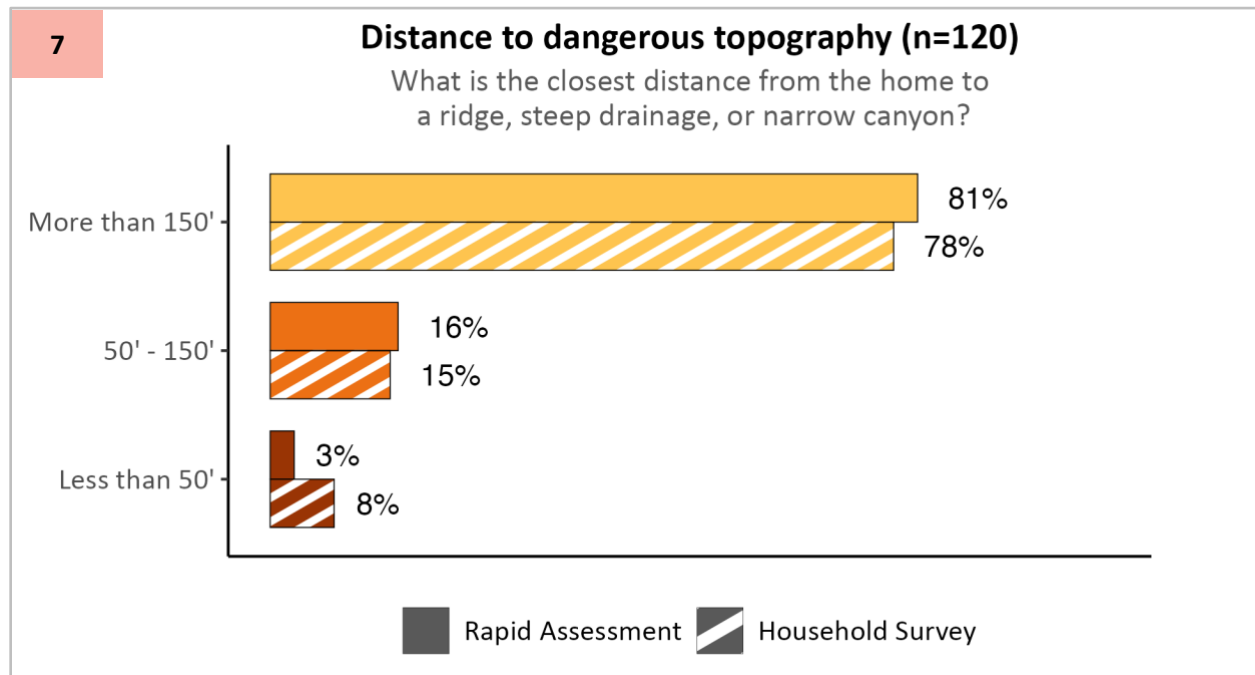
What is the closest distance to a neighboring home?



1.3 Defensible space

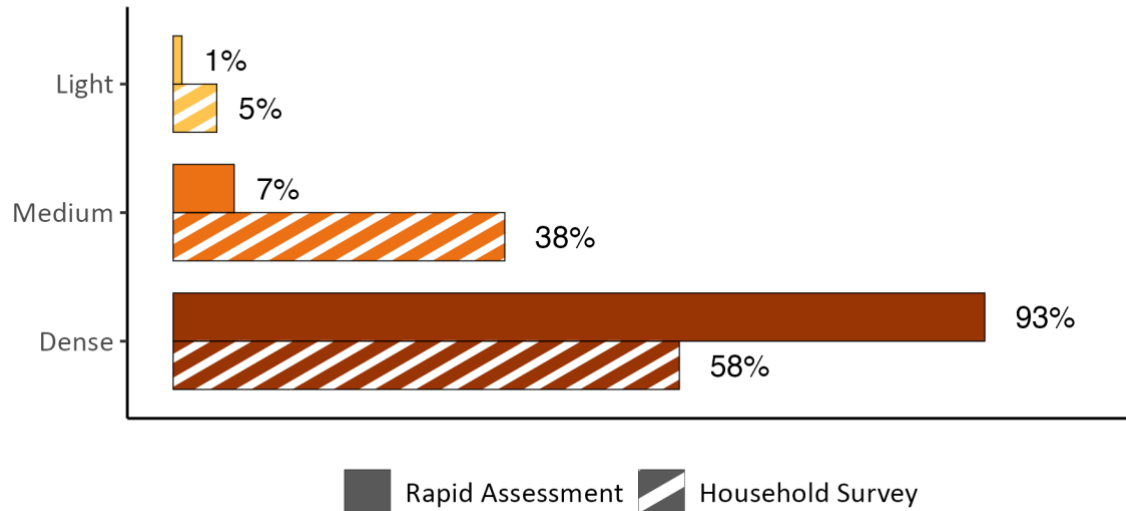


1.4 Background conditions



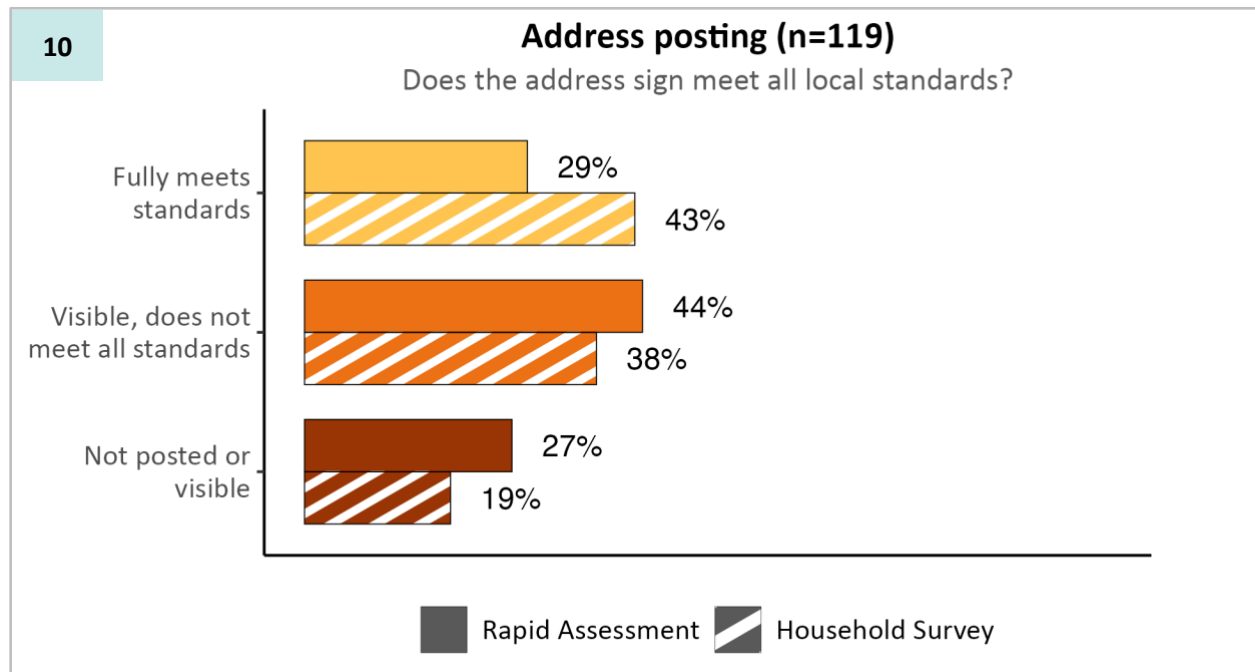
Adjacent fuels (100'-150') (n=120)

Which of the following best describes the dominant vegetation 100'-150' from the home?

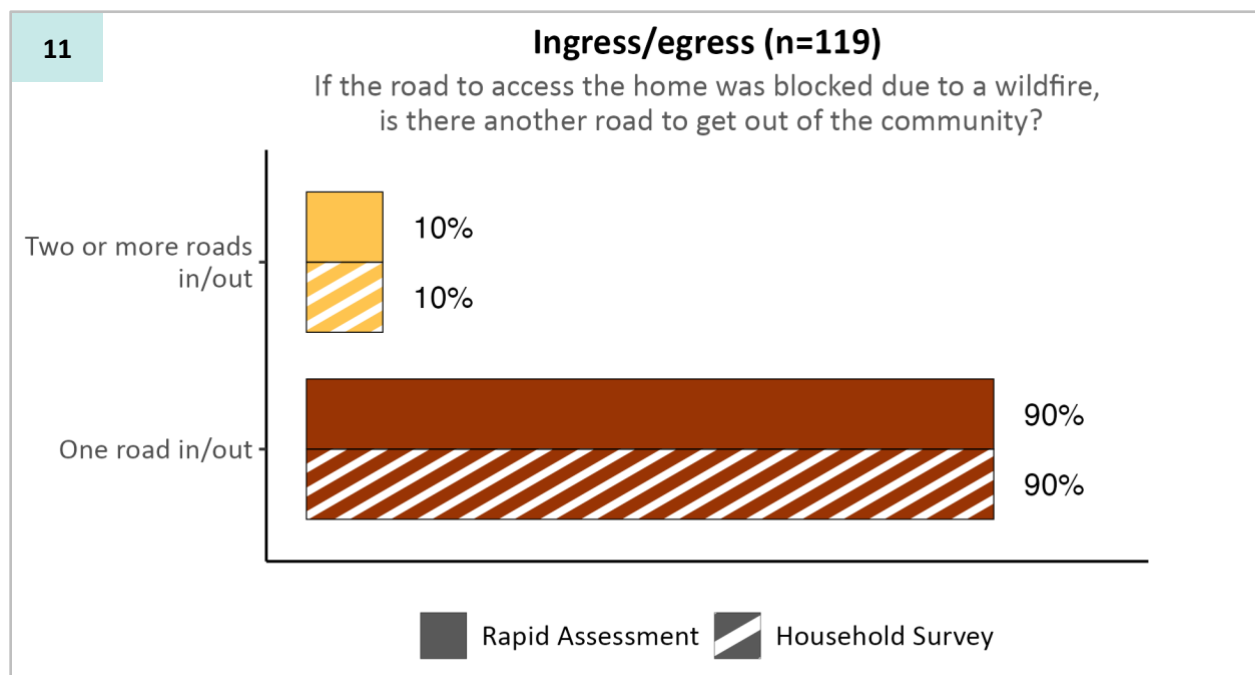


Additional description of categories: Light density ("grasses with less than 1' accumulated dead material or hardwood stand (e.g., birch, aspen, alder, cottonwood) without spruce and without a dense understory"), medium ("isolated shrubs/trees or mixed hardwood/spruce stand without a dense understory"), dense ("dense spruce stand or mixed hardwood/spruce stand with dense understory (e.g., small spruce, dead grasses, thick lichen)").

1.5 Access



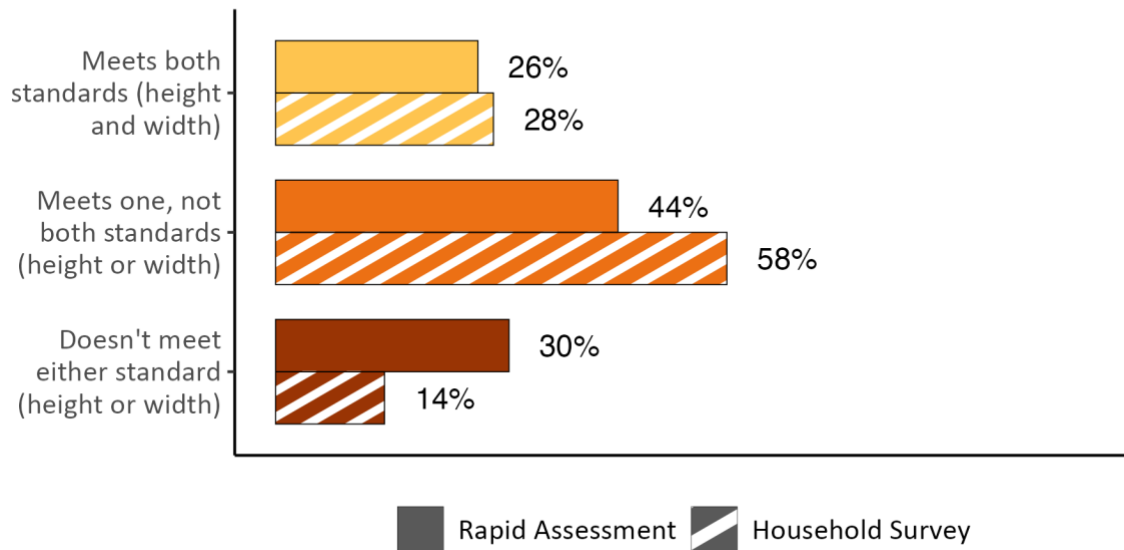
Standards: 3-inch numerals, on a contrasting background, made of durable materials, visible from road, and reflective.



12

Driveway clearance (n=109)

Does the driveway meet horizontal and vertical clearance standards?

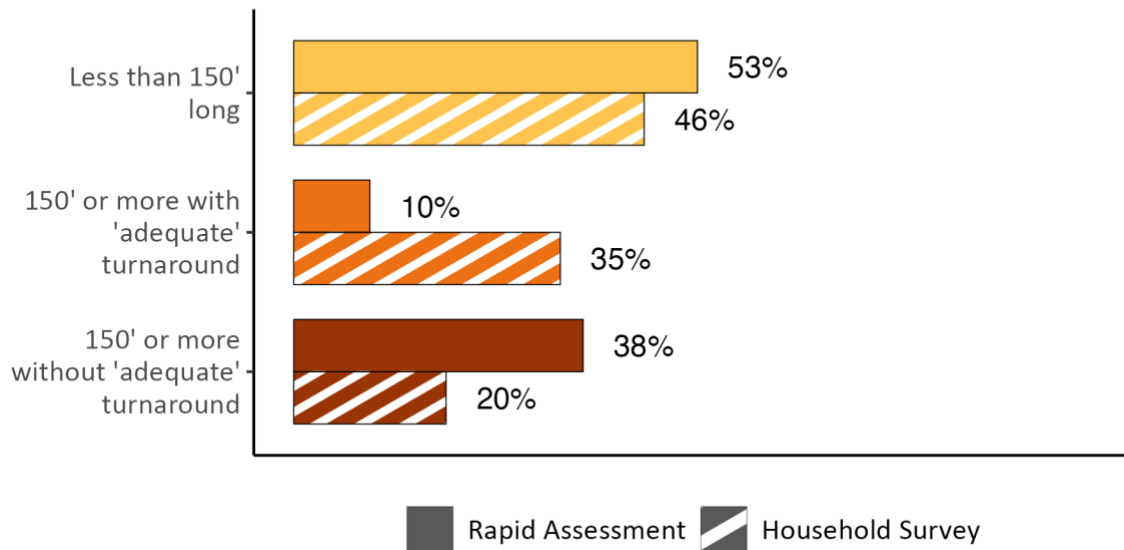


Standards: height at least 13.5' and width at least 20'.

13

Driveway length (n=112)

What best describes the driveway?



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.

2.1. 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=297)	Subset of rapid assessments with a paired household survey (n=120)	Self-assessment from household surveys (n=120)
Low	3%	2%	7%
Moderate	10%	12%	53%
High	56%	59%	32%
Very high	11%	13%	9%
Extreme	20%	14%	0%

2.2. Home ignition potential

Risk attribute: Roof What is the most vulnerable roofing material?			
Response categories	All rapid assessments in study area (N=297)	Subset of rapid assessments with a paired household survey (n=119)	Self-assessment from household surveys (n=119)
Tile, metal, or asphalt shingles	83%	89%	98%
Wood (shake shingles)	17% ^a	11% ^b	2%
a. Out of all rapid assessments in the study area, 34 were missing/unobserved (11%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 8 were missing/unobserved (7%) 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=297)	Subset of rapid assessments with a paired household survey (n=120)	Self-assessment from household surveys (n=120)
Stucco, cement, brick, stone, or other non-combustible siding	1%	1%	16%
Log or heavy timbers	11%	15%	24%
Wood or vinyl siding	88% ^a	84% ^b	60%
a. Out of all rapid assessments in the study area, 23 were missing/unobserved (8%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 8 were missing/unobserved (7%) and included in the highest risk category.			

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=297)	Subset of rapid assessments with a paired household survey (n=120)	Self-assessment from household surveys (n=120)
No combustible attachments	5%	2%	13%
Combustible attachments present	95% ^a	98% ^b	87%
a. Out of all rapid assessments in the study area, 71 were missing/unobserved (24%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 25 were missing/unobserved (21%) and included in the highest risk category.			

Risk attribute: Distance to adjacent homes What is the closest distance to a neighboring home?			
Response categories	All rapid assessments in study area (N=297)	Subset of rapid assessments with a paired household survey (n=120)	Self-assessment from household surveys (n=120)
More than 100'	70%	73%	70%
30' – 100'	20%	19%	27%
10' – 29'	1%	1%	3%
Less than 10'	8% ^a	8% ^b	0%
a. Out of all rapid assessments in the study area, 23 were missing/unobserved (8%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 9 were missing/unobserved (8%) and included in the highest risk category.			

2.3. Defensible space

Risk attribute: Distance to overgrown vegetation (0 – 100 ft) What is the closest distance from the home to overgrown, dense, or unmaintained vegetation?			
Response categories	All rapid assessments in study area (N=297)	Subset of rapid assessments with a paired household survey (n=121)	Self-assessment from household surveys (n=121)
More than 100'	1%	2%	17%
Between 30' - 100'	13%	12%	45%
Between 5' - 29'	40%	40%	37%
Less than 5'	46% ^a	47% ^b	1%
a. Out of all rapid assessments in the study area, 60 were missing/unobserved (20%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 28 were missing/unobserved (23%) and included in the highest risk category.			

Risk attribute: Distance to other combustibles (non-vegetation) 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	All rapid assessments in study area (N=297)	Subset of rapid assessments with a paired household survey (n=120)	Self-assessment from household surveys (n=120)
More than 30' or no combustible items	5%	4%	27%
5'-30'	29%	25%	58%
Less than 5'	66% ^a	71% ^b	15%
a. Out of all rapid assessments in the study area, 64 were missing/unobserved (22%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 28 were missing/unobserved (23%) and included in the highest risk category.			

2.4. 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=297)	Subset of rapid assessments with a paired household survey (n=120)	Self-assessment from household surveys (n=120)
More than 150'	78%	81%	78%
50' - 150'	16%	16%	15%
Less than 50'	6% ^a	3% ^b	8%
a. Out of all rapid assessments in the study area, 10 were missing/unobserved (3%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 3 were missing/unobserved (3%) and included in the highest risk category.			

Risk attribute: Slope 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?			
Response categories	All rapid assessments in study area (N=297)	Subset of rapid assessments with a paired household survey (n=121)	Self-assessment from household surveys (n=121)
Gentle: less than 20%	49%	45%	43%
Moderate: between 20% and 45%	39%	42%	47%
Steep: greater than 45%	11% ^a	12% ^b	10%
a. Out of all rapid assessments in the study area, 8 were missing/unobserved (3%) 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: 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=297)	Subset of rapid assessments with a paired household survey (n=120)	Self-assessment from household surveys (n=120)
Light	1%	1%	5%
Moderate	7%	7%	38%
Dense	92% ^a	93% ^b	58%
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, 3 were missing/unobserved (3%) and included in the highest risk category.			

2.5. Access

Risk attribute: Address Posting Does the address sign meet the standards?			
Response categories	All rapid assessments in study area (N=297)	Subset of rapid assessments with a paired household survey (n=119)	Self-assessment from household surveys (n=119)
Fully meets standard	21%	29%	43%
Address sign is visible, but does not meet all standards	41%	44%	38%
Not posted or visible from the primary road	38% ^a	27% ^b	19%
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, 1 was missing/unobserved (1%) and included in the highest risk category.			

Risk attribute: Ingress/Egress 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	All rapid assessments in study area (N=297)	Subset of rapid assessments with a paired household survey (n=119)	Self-assessment from household surveys (n=119)
Two or more roads in/out	21%	10%	10%
One road in/out	79% ^a	90% ^b	90%
a. Out of all rapid assessments in the study area, 5 were missing/unobserved (2%) 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: Driveway clearance Does the driveway meet the horizontal and vertical clearance standards?			
Response categories	All rapid assessments in study area (N=297)	Subset of rapid assessments with a paired household survey (n=109)	Self-assessment from household surveys (n=109)
Meets both driveway standards	29%	26%	28%
Meets one, but not both , standards (height or width)	39%	44%	58%
Does not meet either standard (height or width)	32%	30%	14%
a. Out of all rapid assessments in the study area, 5 were missing/unobserved (2%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 2 were missing/unobserved (2%) 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=297)	Subset of rapid assessments with a paired household survey (n=112)	Self-assessment from household surveys (n=112)
150 feet long or less	47%	53%	46%
Longer than 150 feet with turnaround “adequate” turnaround	9%	10%	35%
Longer than 150 feet without “adequate” turnaround	43% ^a	38% ^b	20%
a. Out of all rapid assessments in the study area, 24 were missing/unobserved (8%) and included in the highest risk category. b. Out of the subset of rapid assessments with a paired household survey, 7 were missing/unobserved (6%) and included in the highest risk category.			

Appendix E: Wildfire Research (WiRē) Household Survey Summary

Begins on next page.

Living with Wildfire in Cooper Landing in 2023



Number of completed surveys: 147

Number of surveys mailed: 297

n = number of observations

Response rate: 49.5%

Blue numbers are percent responses (might not total to 100% due to rounding)

Red words are variable names and the number of responses (n=)

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 May 31, 2024*

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

When choosing a response, please fill in the circle completely. Correct: ☒ Incorrect: ☐ ☐ ☐

ownrent_a (n=144)

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

37% Own: primary home
63% 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 Cooper Landing home?
(*Fill in all that apply*) (n=144)

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
53%	58%	58%	64%	69%	85%	95%	97%	94%	91%	74%	62%	60%	1%

rentout (n=143)

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

87% No, I do not rent out my home
11% Yes, I rent out my home short-term
1% Yes, I rent out my home long-term

fulltime (n=137)

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

AVERAGE = 2002

yrbuild (n=134)

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

AVERAGE = 1986

riskawar (n=144)

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

44% Very aware
42% Somewhat aware
11% Not aware
3% Don't remember

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

fire (n=142)

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

- 3% There has been a wildfire on my property
- 24% Less than 2 miles away but not on my property
- 57% 2 to 10 miles away
- 12% More than 10 miles away
- 4% Not sure

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

		No	Yes
evacuated (n=142)	I have evacuated from my Cooper Landing home due to a wildfire or threat of a wildfire	64%	36%
smokedam (n=133)	My Cooper Landing home has had wildfire smoke damage	95%	5%
firedam (n=133)	My Cooper Landing home has had wildfire damage	99%	1%
destroy (n=133)	My Cooper Landing home was destroyed by a wildfire	100%	0%

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

		No	Yes	Not applicable
evacppl (n=141)	For the people in my household	25%	75%	
evacpets (n=138)	For the pets in my household and on my property	20%	42%	38%
evaclivstoc (n=136)	For livestock on my property	10%	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=147)

	Completed action?		Want more information about the action?	
Identify how I will be notified about an evacuation	evacact1_a	57%	evacinfo1_a	31%
Sign up for a wildfire evacuation notification system (KPB Alerts at https://info.kpb.us/)	evacact2_a	58%	evacinfo2_a	27%
Identify safe evacuation routes (multiple, if possible)	evacact3_a	66%	evacinfo3_a	22%
Identify a location that my household will evacuate to	evacact4_a	59%	evacinfo4_a	20%
Identify what to take and what to leave behind during an evacuation	evacact5_a	73%	evacinfo5_a	10%
Discuss evacuation with my neighbors	evacact6_a	24%	evacinfo6_a	27%
Create a checklist for steps to take before evacuating	evacact7_a	30%	evacinfo7_a	31%
Identify a place to stay during a long-term evacuation	evacact8_a	62%	evacinfo8_a	14%
Pack a “go bag” with items needed during an evacuation	evacact9_a	45%	evacinfo9_a	20%
Provide evacuation information to renters, if applicable	evacact10_a	19%	evacinfo10_a	11%

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

		No	Yes	Don't know
insure9 (n=143)	Do you currently have homeowner's insurance?	10%	90%	
insure3 (n=141)	Has an insurance company ever refused to provide or renew insurance because of wildfire risk?	82%	10%	9%
insure4_a (n=141)	Has an insurance company charged a higher premium because of wildfire risk?	33%	16%	50%
insure10_a (n=139)	Has an insurance company ever given you a discount on your premium because you have reduced wildfire risk on your property?	65%	4%	31%
insure12 (n=141)	Do you think your home is adequately insured against loss from wildfire?	19%	65%	16%
insure13_a (n=141)	Has an insurance company ever required you to take action to reduce wildfire risk in order to continue coverage?	78%	16%	6%

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

- 3.1. Does your Cooper Landing home have any of the following roofing materials?
(Fill in all that apply)

rooftype1 (n=143)	Tile, metal, or asphalt shingles	99%
rooftype2 (n=143)	Wood (shake shingles)	1%

- 3.2. Does your Cooper Landing home have any of the following exterior siding materials?
(Fill in all that apply)

sidetype1 (n=144)	Stucco, cement, brick, stone, or other noncombustible siding	21%
sidetype2 (n=144)	Log or heavy timbers	31%
sidetype3 (n=144)	Wood or vinyl siding	62%

attachcomb (n=144)

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

15%	No
85%	Yes

combust_a (n=144)

- 3.4. What is the **closest** distance from your Cooper Landing home to combustible items other than vegetation 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 your property? (Fill in one circle)

30%	More than 30 feet or no combustible items
57%	5 – 30 feet
13%	Less than 5 feet

closeveg_a (n=145)

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

16% More than 100 feet

46% 30 – 100 feet

37% 5 – 29 feet

1% Less than 5 feet

domveg_b (n=144)

3.6. Which of the following best describes the **majority** of the vegetation just beyond 100 feet from your home (about 6 car lengths)? That area might be outside your property boundary and include properties immediately surrounding you. (*Fill in one circle*)

0% Grasses with less than one-foot dead material

2% Isolated shrubs/trees

6% Wooded area with only hardwood trees (birch, aspen, alder, cottonwood) and no small trees/shrubs and tall dead grasses

35% Mixed wooded area with both hardwood (birch, aspen, alder, cottonwood) and spruce trees; no small trees/shrubs and tall dead grasses underneath

50% Mixed wooded area with both hardwood (birch, aspen, alder, cottonwood) and spruce trees; lots of small trees/shrubs and tall dead grasses underneath

8% Dense spruce forest

closehome (n=144)

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

72% More than 100 feet

25% 30 - 100 feet

3% 10 – 29 feet

0% Less than 10 feet

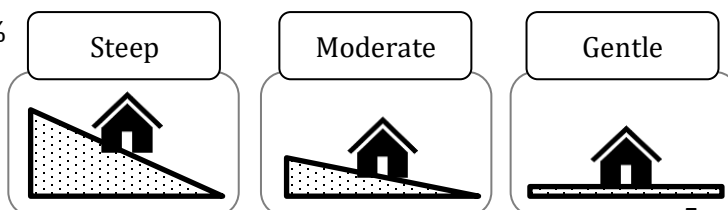
slope (n=145)

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 Cooper Landing home? (*Fill in one circle*)

10% Steep – Greater than 45%

48% Moderate – 20% to 45%

42% Gentle – Less than 20%



ridge (n=143)

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

- 75% More than 150 feet
- 17% 50 – 150 feet
- 8% 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=143)	has an overhead obstruction (e.g., tree limbs) lower than 13.5 feet	83%	17%
drivewayw_b (n=135)	is narrower than 20 feet wide	29%	71%
drivewayl_a (n=134)	is longer than 150 feet	41%	59%
turnarnd_a (n=142)	has room for a fire truck to turn around	38%	62%

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

		No	Yes
homenumvis (n=143)	is visible from road?	22%	78%
homenumcontrast (n=134)	has contrasting background?	32%	68%
reflect_a (n=131)	is reflective?	53%	47%
homenumsize (n=136)	has 3-inch numerals?	26%	74%
homenumdurable (n=136)	is made of durable material?	29%	71%

roads (n=142)

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

- 89% No
- 11% Yes

riskrate (n=144)

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 Cooper Landing property's current overall wildfire risk rating? (Fill in one circle)

- 6% Low risk
- 51% Moderate risk
- 34% High risk
- 8% Very high risk
- 1% Extreme risk

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

talkfire (n=143)

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

26% No
74% Yes

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

		No	Yes
activities1 (n=145)	Removed large or dense vegetation near my Cooper Landing home (e.g., trees, brush)	4%	96%
activities7 (n=138)	Regularly cleared my roof and gutters of leaves and pine needles	21%	79%
activities8 (n=144)	Regularly mowed and raked around my Cooper Landing home	27%	73%
activities2 (n=143)	Made my Cooper Landing home more fire resistant (e.g., replaced roofing, siding, added screening under eaves)	55%	45%
activities3 (n=145)	Helped neighbor(s) reduce vegetation on their properties	58%	42%
activities4 (n=142)	Helped reduce vegetation on community property (e.g., parks, gun range, sport fields)	83%	17%
activities5 (n=143)	Reduced vegetation on nearby public lands (e.g., borough, state, federal lands)	85%	15%
activities6 (n=141)	Participated in a community wildfire preparedness activity (e.g., meeting, chipper day)	78%	22%
activities9 (n=145)	Met with a wildfire professional at my Cooper Landing home to evaluate and discuss my property's wildfire risk	66%	34%
activities10 (n=144)	Interacted with public land managers about vegetation reduction on nearby public lands	78%	22%
activities13 (n=144)	Obtained a permit to burn in 2023 (e.g., for lawn burns, burn barrels, pile burning)	85%	15%
activities14 (n=144)	Obtained a permit to cut trees in the last two years on public lands (borough, federal)	91%	9%

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

		A lot	Somewhat	Not at all
contrib1 (n=143)	Vegetation on my property	23%	63%	14%
contrib2 (n=143)	Physical characteristics of my house or other buildings (ex. roofing or siding) on my property	15%	58%	27%
contrib3 (n=143)	Vegetation on my neighbors' properties	28%	62%	10%
contrib4 (n=144)	Vegetation on nearby public or large undeveloped land	49%	38%	13%
contrib5 (n=144)	Lack of nearby water supply (ex. hydrant or cistern) for fire suppression	34%	31%	35%

4.4. How acceptable are the following land management and regulatory approaches to **reducing wildfire risk** in Cooper Landing to you? *(Fill in one circle per row)*

		Extremely acceptable	Very acceptable	Moderately acceptable	Slightly acceptable	Not at all acceptable
accept1_a (n=145)	Removing trees and other vegetation (thinning) on nearby public lands	44%	38%	11%	6%	1%
accept19 (n=143)	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	38%	34%	19%	6%	4%
accept20 (n=140)	Removing all trees in a defined area (about 2 to 6 acres) on nearby public lands (patch cut)	20%	21%	32%	14%	12%
accept9 (n=143)	Removing trees and other vegetation along roadways for safer evacuation and emergency response	44%	33%	16%	5%	2%
accept2 (n=143)	Burning piles of cut vegetation (slash piles) on nearby public or Borough lands	43%	26%	23%	8%	1%
accept21 (n=143)	Removing vegetation along utility right of ways to reduce fire starts	45%	43%	9%	1%	2%
accept3 (n=143)	Conducting a prescribed fire ignited by fire professionals on nearby public lands	22%	20%	31%	20%	7%
accept4_a (n=143)	Allowing a naturally ignited fire to burn on nearby public lands, when and where appropriate	14%	17%	27%	23%	19%
accept22 (n=141)	Allowing residents to reduce vegetation on nearby public lands	28%	25%	28%	16%	3%
accept18 (n=143)	Burning piles of cut vegetation (slash piles) on my or nearby private land	17%	28%	28%	15%	12%
accept23 (n=142)	Removing fire-prone trees (spruce) and planting fire-resistant trees (birch, aspen) on nearby public lands	40%	32%	17%	8%	3%
accept6 (n=144)	Growth policies or land use regulations that limit new development in fire-prone areas in Cooper Landing	20%	26%	24%	15%	15%
accept7 (n=142)	Building codes that require fire resistant materials for structures located in fire-prone areas	16%	20%	34%	17%	13%
accept8 (n=142)	Development standards that require vegetation management (e.g., removing trees and mowing grass) on lots located in fire-prone areas	16%	20%	32%	15%	17%
accept12 (n=142)	Temporarily shutting off the power grid during extreme fire risk days to avoid wildfire ignitions	18%	23%	30%	13%	16%

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_a (n=143)	With technology, we can control all wildfires.	1%	6%	16%	36%	40%
state26 (n=141)	During a wildfire, I will receive an evacuation order with enough time to safely evacuate.	11%	48%	31%	9%	1%
state6 (n=142)	Wildfires are a natural part of a healthy forest/ecosystem.	36%	52%	8%	3%	1%
state11 (n=140)	I live here for the trees and will not remove any of them to reduce wildfire risk.	0%	3%	9%	41%	47%
state14 (n=141)	Homeowners' actions to reduce wildfire are not effective.	1%	4%	13%	48%	35%
state15 (n=141)	My property is at risk of wildfire.	23%	52%	17%	7%	1%
state17 (n=142)	My effort to reduce wildfire risk on my property is not effective because of the vegetation on nearby private or public lands.	4%	25%	36%	32%	4%
state20 (n=141)	Local firefighters have sufficient resources to protect threatened homes.	2%	4%	23%	43%	27%
state27 (n=141)	Reducing wildfire risk on private property improves firefighter safety.	38%	57%	3%	1%	0%
state22 (n=139)	Wildfires threaten my community water supply.	2%	12%	43%	32%	11%
state24 (n=141)	I plan to move out of the area in the next 12 months because of wildfires.	0%	1%	3%	16%	80%
state25_a (n=140)	New residential development in nearby fire-prone areas increases the wildfire risk to my Cooper Landing property.	6%	24%	39%	23%	8%

5.2. If there is a wildfire on your Cooper Landing 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=143)	I would put the fire out.	6%	6%	21%	32%	34%	0%
lact2 (n=141)	The fire department would save my home.	3%	10%	35%	36%	16%	0%
lact3 (n=143)	My home would have smoke damage.	10%	34%	34%	16%	6%	0%
lact4 (n=143)	My home would have some physical damage.	10%	34%	33%	20%	4%	0%
lact5 (n=142)	My home would be destroyed.	6%	19%	36%	27%	12%	0%
lact6 (n=142)	I would lose money due to the loss of business or income on my property.	9%	12%	13%	11%	15%	41%
lact7 (n=141)	My trees and landscape would burn.	22%	43%	26%	8%	1%	0%
lact9 (n=141)	My neighbors' homes would be damaged or destroyed.	9%	34%	35%	17%	4%	0%
lact12 (n=141)	Direct flame would ignite my home.	9%	28%	24%	28%	11%	0%
lact13 (n=140)	Embers would ignite my home.	4%	21%	37%	30%	9%	0%
lact14 (n=141)	Nearby homes would ignite my home.	0%	16%	19%	28%	32%	5%

chances1 (n=140)

5.3. What do you think is the chance that a wildfire will be on your Cooper Landing 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%
1%	0%	1%	1%	2%	14%	1%	12%	21%	44%	3%

chances2 (n=141)

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 Cooper Landing home? (Fill in one circle)

For sure										No chance
100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
6%	5%	11%	5%	6%	17%	6%	13%	18%	12%	1%

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)*

Information from one of these sources, how useful has it been? (n in one circle per row)			Usefulness of information among respondents who received information from the source (sums to ~100%)					
		HAS Received info from source		Extremely useful	Very useful	Moderately useful	Slightly useful	Not at all useful
Cooper Landing Emergency Services	sourcerec1 (n=140)	71%	sourceuse1 (n=99)	21%	37%	36%	4%	1%
Community group	sourcerec2 (n=136)	51%	sourceuse2 (n=69)	25%	23%	29%	13%	10%
Local tree contractor (tree cutter, tree services)	sourcerec28 (n=135)	56%	sourceuse28 (n=75)	15%	35%	27%	13%	11%
Office of Emergency Management	sourcerec32 (n=135)	59%	sourceuse32 (n=80)	15%	40%	28%	15%	3%
Local government	sourcerec29 (n=138)	51%	sourceuse29 (n=71)	8%	32%	34%	20%	6%
Tribal entity	sourcerec52 (n=134)	8%	sourceuse52 (n=11)	0%	27%	0%	27%	45%
2022 Kenai Peninsula Community Wildfire Protection Plan	sourcerec47 (n=137)	46%	sourceuse47 (n=63)	13%	35%	27%	17%	8%
Kenai Peninsula Ready-Set-Go! (info.kpb.us)	sourcerec24 (n=137)	67%	sourceuse24 (n=92)	18%	39%	28%	12%	2%
Alaska Firewise	sourcerec5 (n=136)	65%	sourceuse5 (n=88)	23%	35%	31%	10%	1%
Kenai National Wildlife Refuge	sourcerec53 (n=136)	29%	sourceuse53 (n=39)	5%	26%	33%	18%	18%
All Lands All Hands (ALAH)	sourcerec54 (n=136)	10%	sourceuse54 (n=13)	8%	23%	8%	38%	23%
Alaska Division of Forestry and Fire Protection	sourcerec55 (n=134)	49%	sourceuse55 (n=66)	14%	36%	38%	12%	0%
Chugach National Forest	sourcerec14 (n=136)	42%	sourceuse14 (n=57)	7%	30%	47%	11%	5%
Media (newspaper, TV, radio, internet)	sourcerec4 (n=141)	65%	sourceuse4 (n=92)	9%	22%	34%	28%	8%

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) (n=147)

	I receive information from this source		I would like to receive information from this source	
Email/e-newsletter	receiveinfo1_a	41%	wantinfo1_a	43%
Social media (Facebook, Twitter)	receiveinfo5_a	25%	wantinfo5_a	12%
Conversations with local wildfire specialists	receiveinfo10_a	31%	wantinfo10_a	33%
Community meetings	receiveinfo3_a	38%	wantinfo3_a	27%
Internet (non-social media)	receiveinfo6_a	43%	wantinfo6_a	20%
Mailed newsletter	receiveinfo2_a	27%	wantinfo2_a	32%
TV news	receiveinfo7_a	33%	wantinfo7_a	14%
Newspaper	receiveinfo8_a	22%	wantinfo8_a	14%
Radio	receiveinfo9_a	27%	wantinfo9_a	17%

oemnum (n=142)

6.3. Do you know the number to reach the Office of Emergency Management call center? (Fill in one circle)

79% No

21% Yes

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 Cooper Landing property.

- 7.1. Do any of the following **limit your ability** to take action to reduce the wildfire risk on your Cooper Landing property (e.g., cutting trees, changing roof/siding)? *(Fill in all that apply for each row)*

Personal resources (n=141)	factor1_a Financial cost 28%	factor2_a Time to do the work 40%	factor3_b Physical ability to do the work 40%	factorno1_a None of these 32%
Lack of specific information about... (n=138)	factor11_a Factors contributing to my property's wildfire risk 14%	factor4_a How to reduce wildfire risk on my property 16%	factor12_a Where to dispose of cut vegetation (slash) 15%	factorno2_a None of these 70%
Personal perspectives (n=136)	factor6_a I do not want to change the way my property looks 10%	factor5_b I do not think taking action would reduce my property's wildfire risk 7%	factor13_a It's a low priority to me 7%	factorno3_a None of these 79%
Community (n=137)	factor14_a Lack of options for disposing of cut vegetation (slash) 16%	factor9_b Restrictions on the changes I can make to my property 5%	factor15_a Social pressure from neighbors 1%	factorno4_a None of these 78%

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

Resources (n=139)	incentv1	incentv3	incentv4	incentvno1
	Cost-share or financial assistance 50%	Help doing the work 52%	Recommended contractors 17%	None of these 24%
Information (n=138)	incentv6	incentv7	incentv8	incentvno2
	A report describing my property's wildfire risk factors 51%	Videos showing how to reduce risk on a property in my area 22%	One-on-one visit with wildfire risk experts on my property 58%	None of these 28%
Other (n=140)	incentv9	incentv10	incentv11	incentvno3
	Feedback on work I've done to reduce my property's risk 39%	Recognition for taking action 9%	Neighborhood group that organizes wildfire risk-reduction activities 22%	None of these 50%

Section 8: In this section, we ask about personal and household characteristics. . As with all questions in this survey, including those in this section, your name will not be connected to your answers in any way

risktake1 (n=138)

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%	7%	12%	14%	29%	8%	13%	8%	4%	1%

age (n=140)

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

MEAN AGE: 66

gender (n=140)

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

76% Male
24% Female
0% Other

educ (n=141)

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

0% Less than high school
3% High school graduate
11% Some college or technical school
7% Technical or trade school
35% College graduate
9% Some graduate work
34% Advanced degree (M.D., M.A., M.S., Ph.D., etc.)

employ (n=141)

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

- 33% Employed full time (including self-employed)
- 11% Employed part time (including self-employed)
- 1% Unemployed or do not work outside of the home
- 56% Retired

income_a (n=121)

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

- 2% Less than \$24,999
- 6% \$25,000 – \$49,999
- 10% \$50,000 - \$74,999
- 15% \$75,000 - \$99,999
- 38% \$100,000 - \$199,999
- 30% \$200,000 or more

Thank you for your help. Survey results will be reported in summary form and your name will not be connected to your answers in any way. Please use the space below to write any additional comments.

Appendix F: Outreach Materials

Begins on next page.



Understand your WILDFIRE RISK

WiRē
wildfire research

The Wildfire Research (WiRē) Center is a partner of Cooper Landing Emergency Services and the Kenai Peninsula Borough Office of Emergency Management. For more information, visit wildfireresearchcenter.org.



RAPID WILDFIRE RISK ASSESSMENTS

We conducted a rapid wildfire risk assessment of 297 residential properties in the community. This 60-second evaluation was performed from the road by trained assessors.

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



HOUSEHOLD SURVEY RESULTS

In 2024, we mailed 297 surveys on wildfire risk to households in Cooper Landing. 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 147 completed surveys, a **49.5% response rate**.

Thank you to all of those who participated!



Cooper Landing Emergency Services

- 📞 907-595-1800
- ✉ operations.cles@outlook.com
- 🌐 cooperlandingservices.org
- 📍 38748 Snug Harbor Rd
Cooper Landing, AK 99572
- 📅 For information on community chipping events or to volunteer, call or email CLES.



Kenai Peninsula Borough Office of Emergency Management

- 📞 907-262-4910
- ✉ oem@kpb.us
- 🌐 info.kpb.us
- 📍 253 Wilson Ln
Soldotna, AK 99669



Alaska Department of Natural Resources Division of Forestry and Fire Protection

Kenai-Kodiak Area

- 📞 907-260-4200
- 📞 Burn permit hotline
907-260-4269
- 🌐 Burn permit information
dnr.alaska.gov/burn/fireareas/kenai-kodiak
- 📍 Kenai-Kodiak Area Office
42499 Sterling Highway
Soldotna, AK 99669



U.S. Department of Agriculture Forest Service Seward Ranger District

Chugach National Forest

- 📞 907-288-3178
- 🌐 www.fs.usda.gov/chugach
- 📍 33599 Ranger Station Spur
(mile marker 23.5)
Seward, AK 99664

RECOMMENDED HOMEOWNER ACTIONS

For more
details,
see page 2



CREATE AND MAINTAIN
DEFENSIBLE SPACE



COMPLETE EVACUATION
PREPARATIONS

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

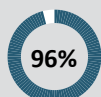


TO-DO LIST

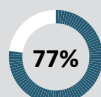
- ☐ Regularly remove all tree needles, leaves, and other debris from your home's roof, deck, and gutters, as well as under the deck.
- ☐ Move firewood, propane tanks, and all other combustible items at least 30 feet away from your home.
- ☐ Prune tree branches hanging over your home's roof and within 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 and stain).

Keep up the good work!

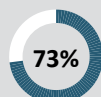
Survey respondents reported having done these wildfire-related activities on their property:



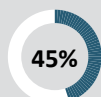
Reduced
vegetation



Regularly
cleared roof
and gutters



Regularly
mowed/
raked around
residence



Hardened
home

Understand your home's **DEFENSIBLE SPACE**

ZONE 1 (0–5 feet from home)

25% Homes in the study area had adequate defensible space in Zone 1 according to trained assessors.

Zone 1 is the priority area to prevent flames from coming in direct contact with the structure. Clear vegetation and other combustibles within 5 feet of the home.

ZONE 2 (5–30 feet from home)

1% Homes in the study area had adequate defensible space in Zone 2 according to trained assessors.

In Zone 2, proper maintenance includes reducing fuels for fire to help decrease fire spread and intensity.

ZONE 3 (30–100 feet from home)

Zone 3 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.

79%

Homes do not have address signs that fully meet standards.

- **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.



DOWNLOAD
the Ready, Set, Go!
preparedness guide
Visit [info.kpb.us/
pages/preparedness-
guide](http://info.kpb.us/pages/preparedness-guide) or scan the QR
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SIGN UP
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notifications
Visit [my.kpb.us/users/
sign_up](http://my.kpb.us/users/sign_up) or scan the QR
code to the left.



STAY INFORMED
Visit the Kenai
Peninsula Borough
Office of Emergency
Management's Facebook
page at [www.facebook.
com/KPBAlerts](http://www.facebook.com/KPBAlerts) or scan
the QR code to the left.

Evacuation preparations

Emergency notifications (pp. 10–12)

- ☐ Identify how I will be notified about an evacuation.
- ☐ Sign up for Kenai Peninsula Borough cell phone emergency notification alerts (p. 12).

Where to evacuate (pp. 17–20)

- ☐ Identify safe evacuation routes (multiple routes, if possible).
- ☐ Identify a location that my household will evacuate to (don't forget about pets and livestock).
- ☐ Identify a place to stay during a long-term evacuation.

Other critical steps (pp. 21–30)

- ☐ 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.



REQUEST
an address sign
Visit bit.ly/KPB-E911-Address
or scan the QR code to the left.



LEARN MORE
about defensible space
Visit bit.ly/Firewise-Alaska
or scan the QR code to
the left.

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