

2019

Elk Falls Ranch Firewise® Community Wildfire Risk Assessment



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NFPA’s Firewise USA® program teaches people how to live with wildfire and increase their home’s chance of survival through proactive actions, while encouraging neighbors to work together to reduce losses and damage. The community wildfire risk assessment is an important step in the Firewise USA® recognition process. It’s a tool to help residents and their community members understand their wildfire risk and engage them in risk reduction efforts.

In order to become and maintain a Firewise Community, a number of steps must be taken. Including (taken from the NFPA Website):

- **Conduct a Wildfire Risk Assessment:** Obtaining a written wildfire risk assessment from your state forestry agency or fire department is the first step in becoming a nationally recognized Firewise USA® site. The risk assessment will be the board/committee’s primary tool in determining the risk reduction priorities within your site’s boundaries. Assessments need to be updated every five years.
- **Form a Board/Committee:** Form a board/committee that’s comprised of residents and other applicable wildfire stakeholders. Consider inviting the local fire department, state forestry agency, elected officials, emergency manager, and if applicable the property management company to participate. This group will collaborate on developing the site’s risk reduction priorities, develop a multi-year action plan based on the risk assessment and oversee the completion of the annual renewal requirements needed to retain an “in good standing” status.
- **Create an Action Plan:** Action plans are a prioritized list of risk reduction projects/investments for the participating site, along with suggested homeowner actions and education activities that participants will strive to complete annually, or over a period of multiple years. Action plans are developed by the board/committee and need updating at least every three years.
- **Perform Educational Outreach:** Each participating site is required to have a minimum of one wildfire risk reduction educational outreach event, or related activity annually.
- **Investment in Wildfire Risk Reduction:** At a minimum, each site is required to annually invest the equivalent of one volunteer hour valued at \$24.14 (the rate is based on the 2017 annual National Hourly Volunteer Rate; which is updated every year) per dwelling unit in wildfire risk reduction actions.

Introduction

The Elk Creek Fire Protection District initiated the Firewise® process for multiple neighborhoods in the Conifer area in 2008. Through a series of meetings in 2010, Elk Falls Ranch community members Marie Hensick and Charlotte Winzenberg helped to organize a Firewise USA® Committee for the Elk Falls Ranch Property Owner’s Association. As of February 2019, the Elk Falls Ranch Firewise® committee members include Bob Fletcher, Mike Pesta, Anita Nissly, and Dan Muller. The following report updates the 2010 Elk Falls Ranch Wildfire Risk assessment.

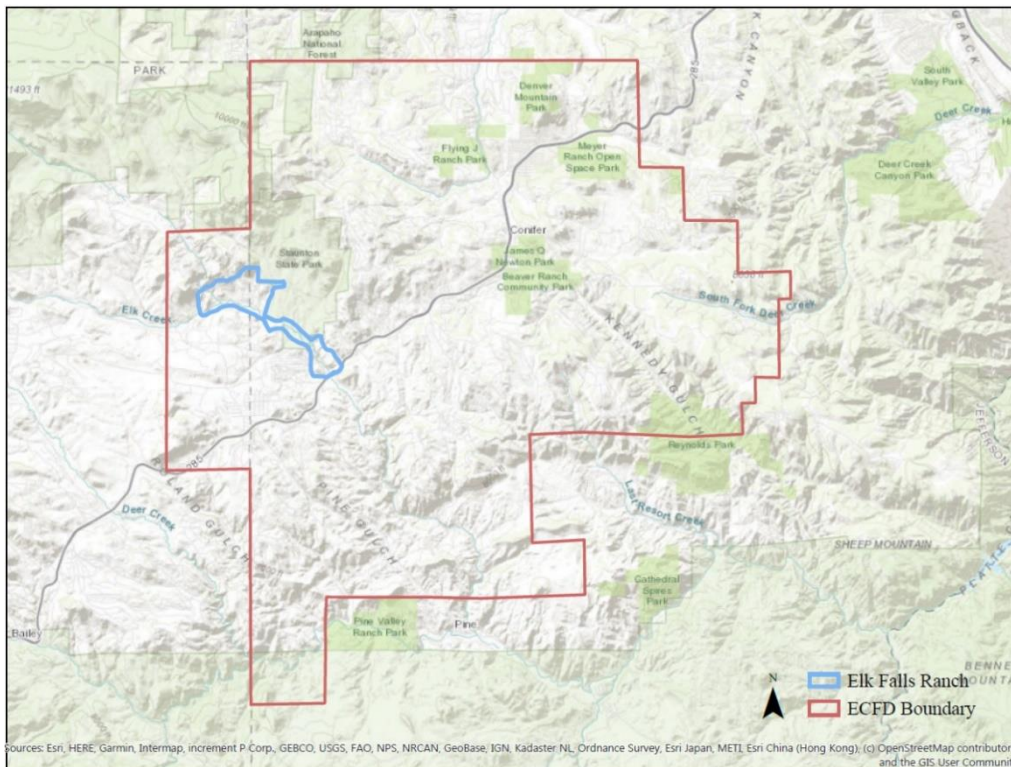
Updating the Site Assessment Process

The Site Assessment process consisted of two site visits by members of the Elk Creek Fire Department in May of 2019. These assessments considered both structural and vegetative components attributing to wildfire risk. A meeting was also conducted on May 13th with the Elk Creek Fire Chief, Wildfire Specialist, and Elk Falls Ranch Firewise® Committee in attendance. Additional information was given by Bob Fletcher in order to update the actions taken since 2010.

Neighborhood Description

Located in both Jefferson and Park Counties about 2-1/2 miles north of Highway 285 in Pine, Colorado, the Elk Falls Ranch Subdivision contains 212 individual parcels of land. Approximately 150 of these parcels have been developed and most homeowners are year-round residents. Access to the entire community is via one road; South Elk Creek Road. The Elk Falls Ranch Subdivision sits just south Staunton State Park and south-west of Conifer Mountain. Protected by the Elk Creek Fire Protection District, the Elk Falls Ranch Subdivision is in the Fire District’s Community Wildland Protection Plan (CWPP).

Elk Falls Ranch Neighborhood



Wildfire Environment

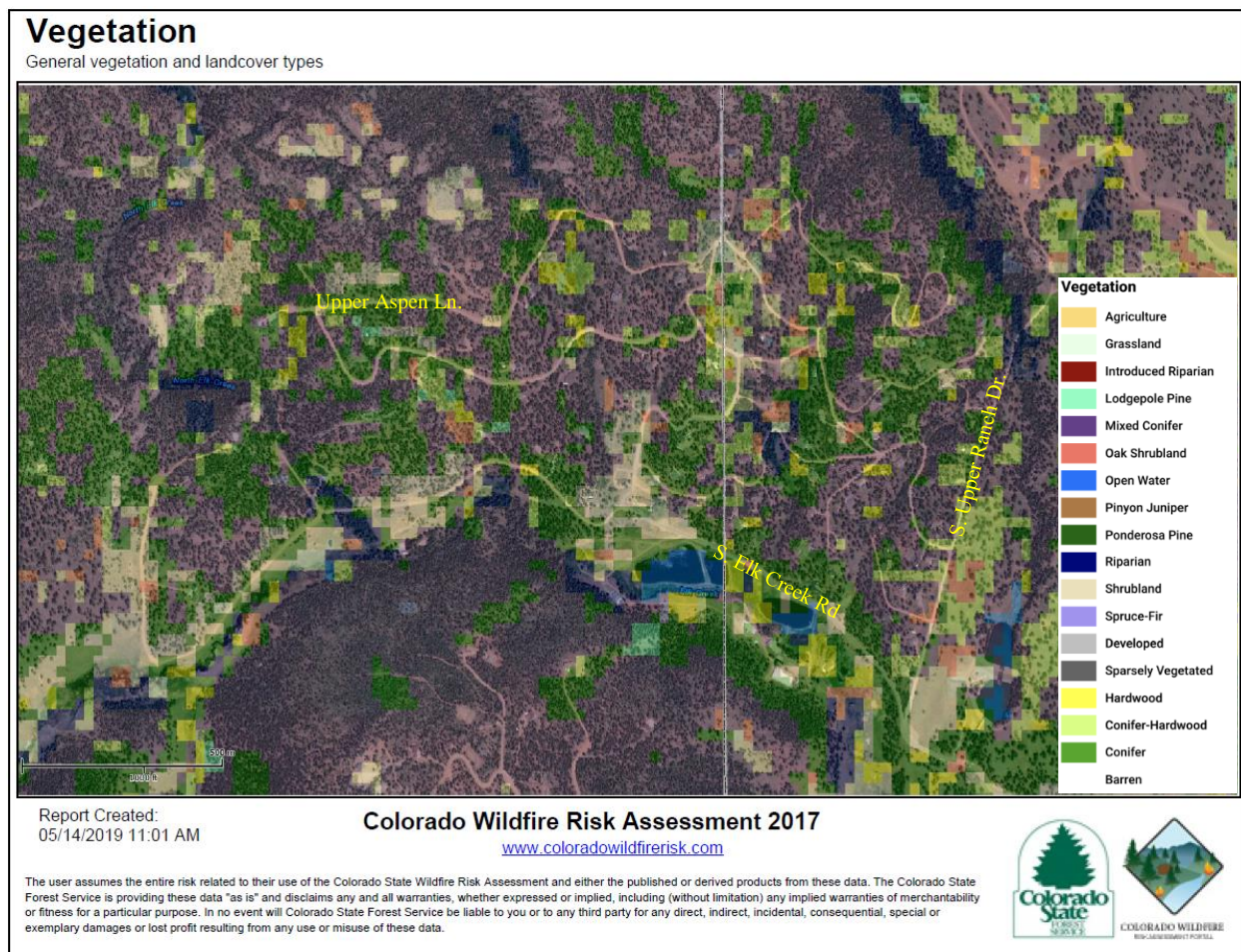
Wildfire History

Regional Wildfire History				
Name	Year	Acres Burned	Evacuations	Homes Lost
Wamblee Fire	2018	2.5	Yes	No
Viking Fire	2018	.75	No	No
Bailey Fire	2018	5	Yes	No
Lower North Fork	2012	4,140	Yes	23 Homes, 2 Lives
Snaking Fires	2003	2,600	Yes	No
Schoonover Fire	2002	3,472	Yes	13 Buildings
Hayman Fire	2002	138,114	Yes	133 homes
Black Mountain fire	2002	250	Yes	No
Hi meadow Fire	2000	10,761	Yes	39 homes
Buffalo Creek Fire	1996	11,853	No	No

The list above is not a complete documentation of all fires in the area. *In 2018, Elk Creek Fire responded to 30 wildland fires within the district.*

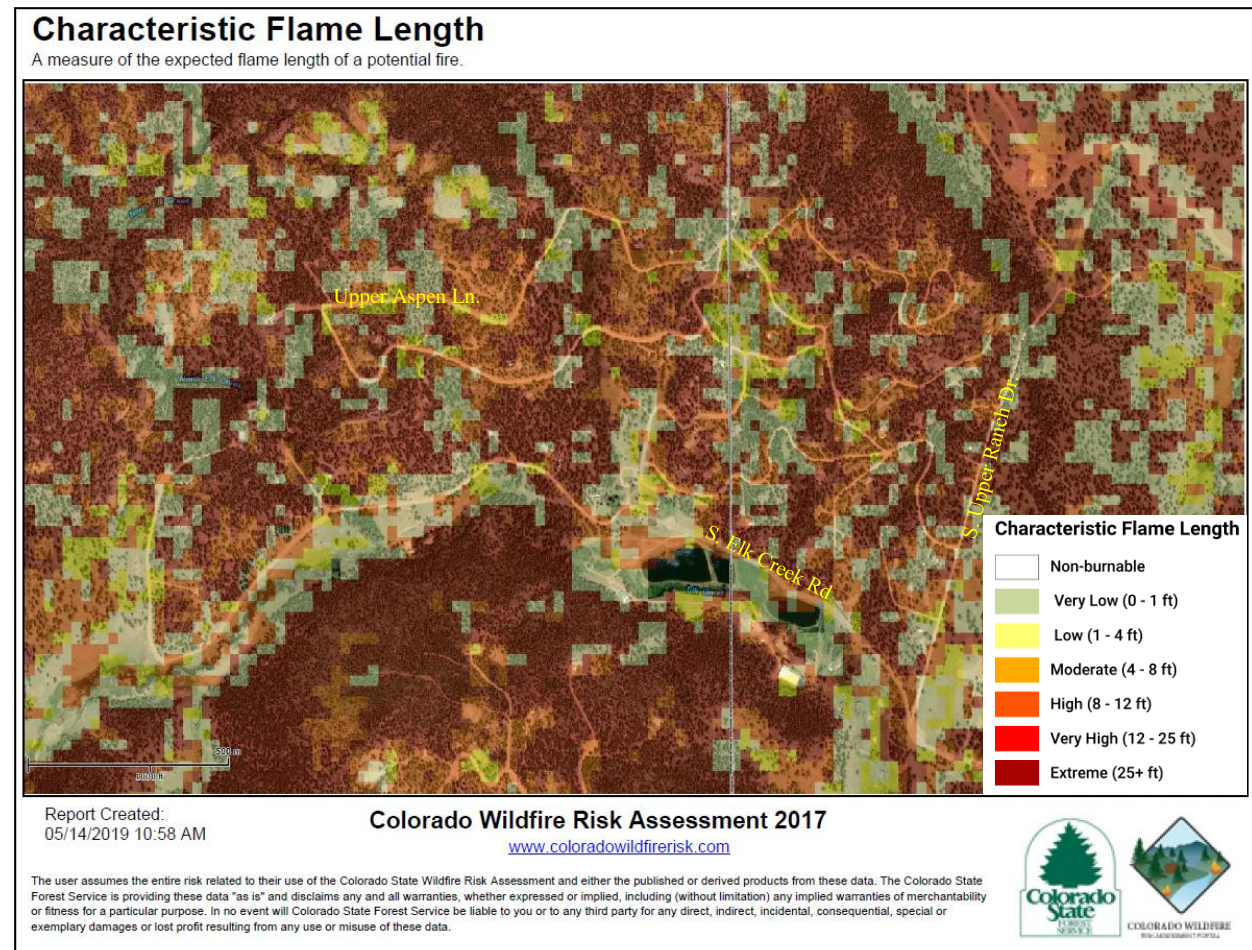
Fuels

Surface fuels in the Elk Falls Ranch area consist of dry climate grass-shrub and conifer litter. The dominant vegetation type is made up of oak and shrubland, Ponderosa Pine, and Mixed Conifer. These species have evolved to be dependent on wildfire in order to thrive and regenerate. The exclusion of fire from these environments (due to suppression) have caused an overloading of fuels across the landscape. At the same time, development in the wildland-urban interface or WUI (the area where vegetation and development meet to create a set of conditions that allow for wildfire to impact development) has expanded to be one the most popular development types in Colorado and across the west. These factors combine to create a highly volatile environment, allowing wildfire to quickly impact developed areas and in some cases destroy entire communities. For these reasons the Elk Creek Fire Protection District CWPP rates the hazard level for Elk Falls Ranch as High.



Fire Type

The following maps and associated descriptions were included to provide a landscape scale assessment of the Elk Falls Ranch area. Analysis of flame length and rate of spread provides a general idea of how a fire would behave within Elk Falls Ranch. The Fire Intensity Scale provides a picture of where hazardous fuels are located and their associated fire behavior. As explained below, these outputs represent an average of low to extreme wildfire weather days. While these outputs are useful for most days throughout the year, extreme wildfire hazard days could generate faster fire growth and more intense conditions. For example, according to the Forest Service Hayman Fire Case Study, the fire “went from 1,200 acres to 61,000 acres in one day.”ⁱⁱ

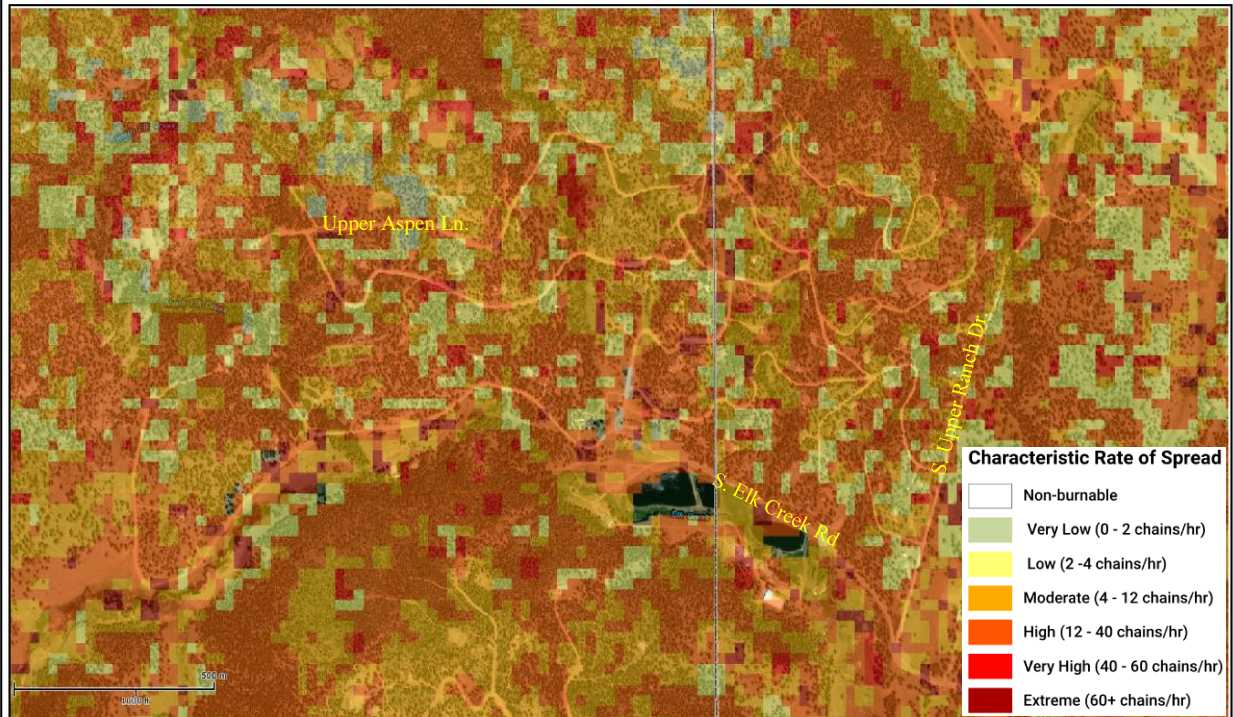


Characteristic Flame Length is the typical or representative flame length of a potential fire based on a weighted average of four percentile weather categories. Flame Length is defined as the distance between the flame tip and the midpoint of the flame depth at the base of the flame, which is generally the ground surface. It is an indicator of fire intensity and is often used to estimate how much heat the fire is generating. Flame length is typically measured in feet (ft). Flame length is the measure of fire intensity used to generate the Fire Effects outputs for the Colorado WRA.

Flame length is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each 30-meter cell in Colorado.ⁱⁱ

Characteristic Rate of Spread

A measure of the expected rate of spread of a potential fire.



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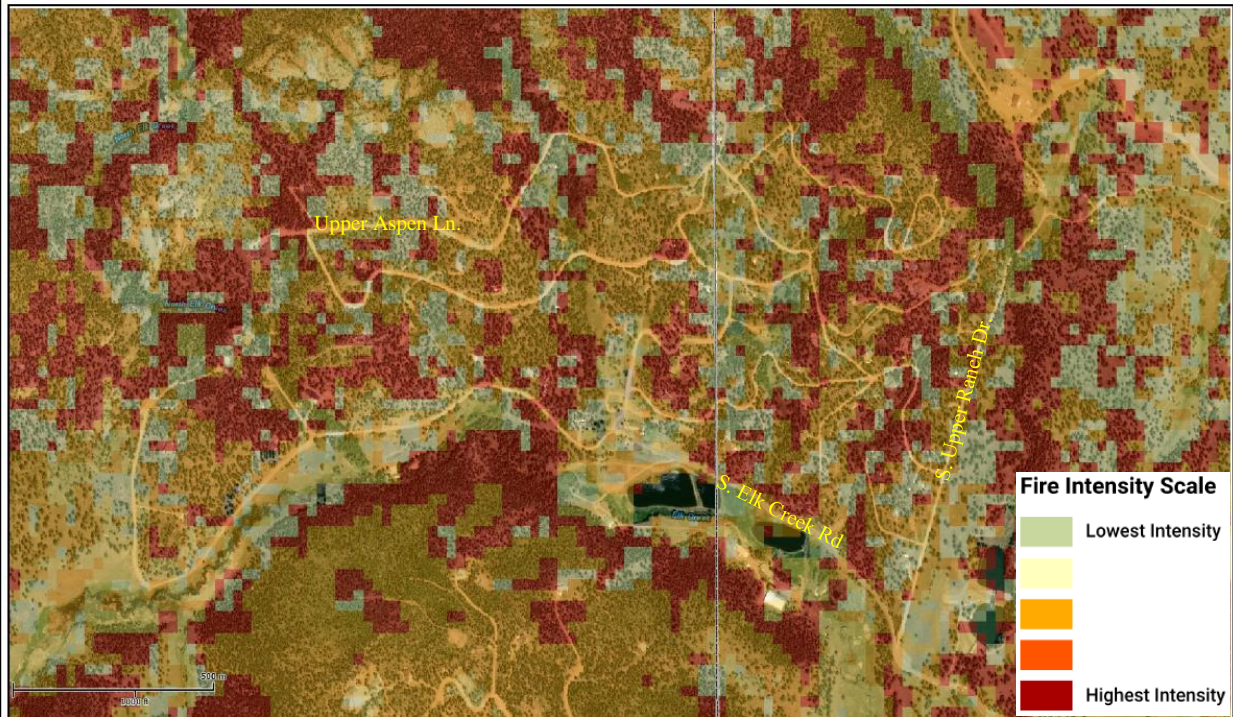


Characteristic Rate of Spread is the typical or representative rate of spread of a potential fire based on a weighted average of four percentile weather categories. Rate of spread is the speed with which a fire moves in a horizontal direction across the landscape, usually expressed in chains (66 feet) per hour (ch/hr) or feet per minute (ft/min). For purposes of the Colorado WRA, this measurement represents the maximum rate of spread of the fire front. Rate of Spread is used in the calculation of Wildfire Threat in the Colorado WRA.

Rate of spread is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each 30-meter cell in Colorado. Thirty (30) meter resolution is the baseline for the Colorado WRA, matching the source surface fuels dataset.ⁱⁱⁱ

Fire Intensity Scale

Quantifies the potential fire intensity by orders of magnitude.



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Fire Intensity Scale (FIS) specifically identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist. Similar to the Richter scale for earthquakes, FIS provides a standard scale to measure potential wildfire intensity. FIS consist of five (5) classes where the order of magnitude between classes is ten-fold. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities.

1. **Class 1, Lowest Intensity:**

Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.

2. **Class 2, Low:**

Small flames, usually less than two feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.

3. **Class 3, Moderate:**

Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.

4. **Class 4, High:**

Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting

possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.

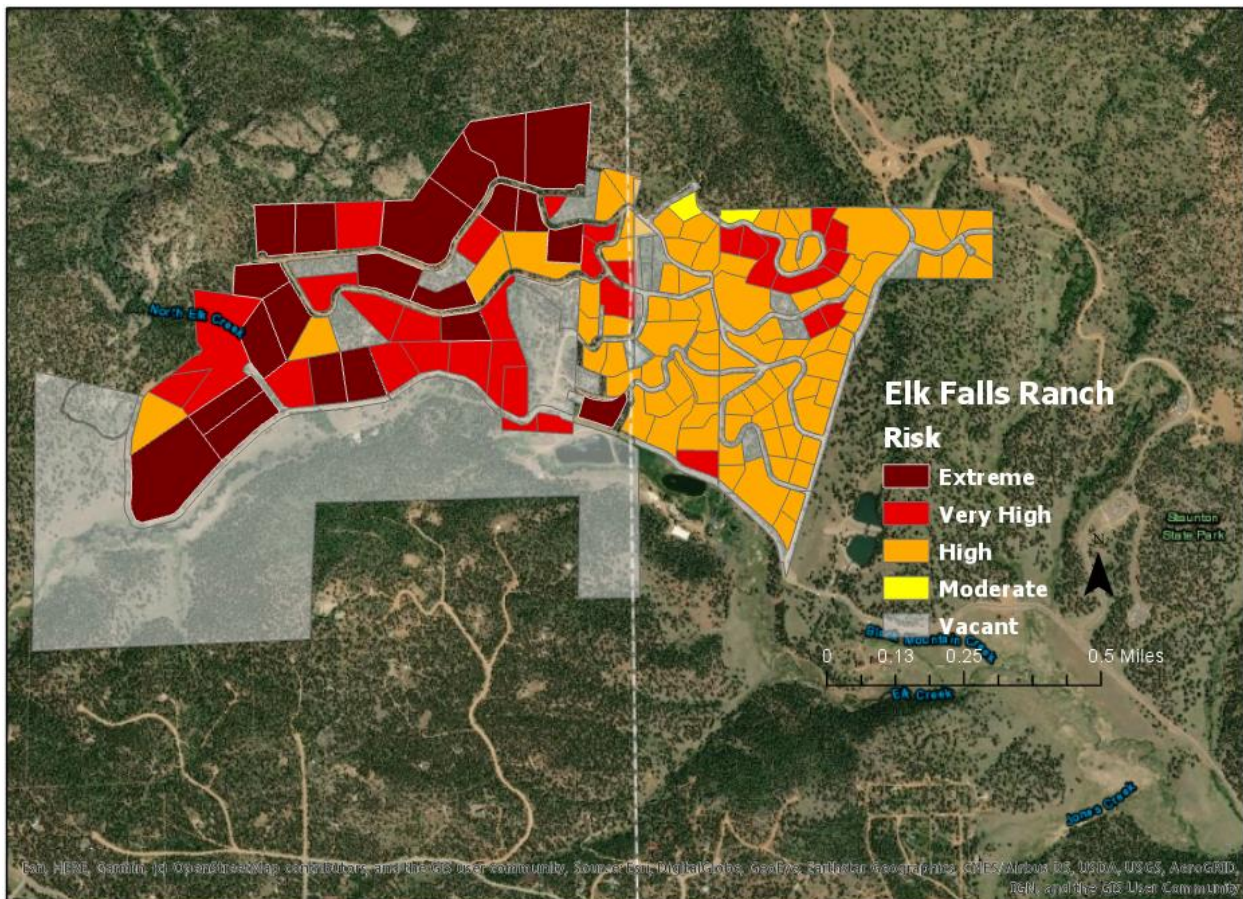
5. **Class 5, Highest Intensity:**

Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.^{iv}

Supporting Risk Assessments

Modeled fire behavior outputs provide a helpful idea of expected fire behavior across the landscape, but do not represent risk on individual parcels of land. To provide a better idea of an individual homeowner's risk, members of Elk Creek Fire conducted a curbside assessment of all developed parcels within the district between 2015 and 2017. Criteria for these assessments included access to the home, topography in the area, fuel loads, roofing, siding, and decking materials, defensible space, and storage of combustibles.

Elk Falls Ranch Parcel Level Risk Assessment



Wildland-Urban Interface Considerations

Historic Conflagrations

More communities in Colorado have experienced significant loss due to extreme fire behavior and weather in the last ten years than ever before (i.e. Fourmile Canyon (2010), Lower North Fork (2012), High Park (2012), Waldo Canyon (2012), Black Forest (2013), West Fork Complex (2013), Beulah Hill (2016), Spring Creek (2018)). **There are many contributing factors to these events, but embers have been identified as the leading cause of home ignitions.** Additionally, once one home is ignited in a moderately populated area, it is then a source of ignition for other homes.

Overlapping Home Ignition Zones

Individual Home Ignition Zone (HIZ) best practices have been implemented on some parcels in Elk Falls Ranch. While this is an important step towards reducing individual properties' wildfire risk, a number of parcels have not implemented defensible space. Many parcels within the POA also have overlapping home ignition zones. These areas can significantly complicate mitigation actions that require coordination with adjacent neighbors and the Elk Falls Ranch POA.



EXAMPLE OF OVERLAPPING HOME IGNITION ZONES. CREDIT FIREWISE USA®.

Street Signs and Address Numbers

Many reflective address signs have been installed or replaced in the Elk Falls Ranch neighborhood. Continuing to install these signs is integral to fast and efficient emergency response, and are critical in identifying homes in low visibility situations. Street signs and “Dead End” signs should be addressed with the same objectives in mind.

Ingress and Egress Routes

Elk Falls Ranch has one ingress and egress route, limiting evacuation capabilities for the area. The egress route is also shared with the Staunton State Park entrance, which can



PHOTO 1: Hard to see road signage. Credit: Elk Creek Fire.

attract significant visitation numbers. If a fire were to occur during peak visitation hours (on weekends), significant access and egress issues could be expected.

Elk Creek Fire Capabilities in the Wildland Urban Interface

Elk Creek Fire Protection District is a combination fire department, capable of staffing two fire engines 24 hours a day. A 12-person fuels mitigation module has also been developed in recent years that is capable of responding to wildfire situations. The remainder of suppression capabilities relies on volunteers within the community. While these resources are adequate for most situations in a rural community, they can be overwhelmed in a wildland-urban interface situation. Residents should not expect a fire engine to be assigned specifically to their home in these scenarios. ***It is critical for homeowners to implement HIZ best practices before the fire starts in order to protect their property.***

Recommendations

Integrate Wildfire Mitigation into the Property Owners Association Board and Planning Documents

The steps taken by Elk Falls Ranch to reduce wildfire risk are commendable. However, wildfire mitigation needs to be an ongoing process to be effective. To integrate wildfire mitigation into the daily decisions of the Property Owners Association (POA) Board and residents, POA documents should be updated and amended to include appropriate wildfire mitigation actions.

- ❖ **Establish a permanent Firewise® committee** in Article VIII Committees of the Amended & Restated Bylaws of Elk Falls Ranch Property Owners Association. Including a wildfire committee in the bylaws would ensure that wildfire is continually addressed in Elk Falls Ranch, allow residents to vote on future mitigation actions, and raise funds for established goals.
- ❖ **Include HIZ requirements in the Elk Falls Ranch Codes, Covenants and Restrictions** in Article I section 7. Landscaping. Include HIZ best practices and maintenance requirements to ensure necessary upkeep.
- ❖ **Include building material restrictions** for new construction and retrofits to reduce the risk of home ignitions due to embers.

Improve and Identify Access and Egress Routes

When a wildfire occurs, residents of Elk Falls Ranch need to be prepared for fast and efficient evacuation. Preparing for extreme conditions during an evacuation can improve the efficiency of the evacuation and safety of the egress route itself. ***If conditions inhibit safe and timely evacuation, staying in a well-prepared home is the second-best option.***

- ❖ **Maintain fuels adjacent to access and egress routes** within the rights-of-way. Remove hazardous fuels and regrowth to reduce potential fire intensity along POA rights-of-way.
- ❖ **Identify additional pull off and turn around areas** to allow for emergency vehicle access during evacuations.
- ❖ **Continue to improve address signage throughout the neighborhood.** In order to be effective, address signs should be attached to a non-combustible surface, such as a t-post or rock.



PHOTO 2: Flammable fuels near access egress routes. Credit: Elk Creek Fire.

- ❖ **Install reflective evacuation route and dead-end signage** throughout the neighborhood to more easily identify correct routes in low visibility situations.

Reduce Hazardous Fuels on a Landscape Scale

While implementing defensible space around structures is critical in their survival during a wildfire event, it does not fully address problem fuels within Elk Falls Ranch. Further vegetation removal is required to create a fire adapted landscape that can maintain the natural look and feel of the neighborhood after a wildfire event.

- ❖ **Continue to reduce fuels in zone 2 and 3** on properties to create a more fire resilient landscape on individual parcels.
- ❖ **Utilize the Elk Creek fire department’s home assessment and chipping programs** to implement defensible space best practices.
- ❖ **Collaborate with Staunton State Park** to reduce fuel loads near the ranch. Explore the possibility of a good neighbor policy to implement full defensible space for homes bordering the park.
- ❖ **Mitigate undeveloped lots and common areas** to zone 2 standards.



PHOTO 3: Regeneration trees within defensible space zone of home. Credit: Elk Creek Fire.

Provide Educational Opportunities for Residents

Providing educational materials and opportunities to the residents of Elk Falls Ranch would act as a constant reminder of the wildfire risk to the neighborhood. An informed public would also allow for more in-depth debate on the actions that should be taken to reduce wildfire risk in the community.

- ❖ **Provide educational materials** through a recurring wildfire mitigation email focusing on mitigation, preparedness, evacuation, and recovery.
- ❖ **Organize a mock evacuation with the Elk Creek Fire Department** to test current evacuation plans and capabilities.
- ❖ **Coordinate Community Mitigation Days** with a focus on community building within the neighborhood and to support less-able residents implement defensible space.
- ❖ **Develop a social media presence** to quickly update residents and link to more in-depth materials.

Next Steps

The Elk Falls Ranch Firewise Committee will create a mission statement, goals, and objectives that will guide the community for the next five years. Below is an action plan outline that can organize tasks and create accountability to move action steps forward.

Elk Falls Ranch Firewise® Work Plan

Mission Statement:

Develop a mission statement and goals with the Firewise® Council

Goal 1					
Goal Statement Here:					
Action Step	Responsible Party	Begin Date	End Date	Resources Required	Notes

Goal 2					
Goal Statement Here:					
Action Step	Responsible Party	Begin Date	End Date	Resources Required	Notes

Goal 3					
Goal Statement Here:					
Action Step	Responsible Party	Begin Date	End Date	Resources Required	Notes

Goal 4					
Goal Statement Here:					
Action Step	Responsible Party	Begin Date	End Date	Resources Required	Notes

Labor Value and Expense Tracking

Year	Labor Hours	Expenses	Labor Value and Expenses	Participating properties	Participation Percentage
2018	595.5	\$9,402	\$23,277	16	11%
2019		\$	\$		
2020		\$	\$		
2021		\$	\$		
2022		\$	\$		
2023		\$	\$		
2024		\$	\$		

Conclusion

In order to operate in high-risk wildfire environments such as Elk Falls Ranch, firefighters rely on homeowners to take action before a fire occurs. Elk Falls Ranch has established itself as Firewise® community, and some great work has been accomplished in the past. However, wildfire mitigation must be a continual process in order to be effective. Elk Creek Fire Protection District will strive to support the mitigation efforts of Elk Falls Ranch, but it is ultimately the responsibility of each homeowner to mitigate their wildfire risk. Performing this work as a community will exponentially increase mitigation effectiveness, leading to a strong and resilient Elk Falls Ranch.

Additional Resources

Below are organizations and publications that can provide helpful information when attempting to implement your Firewise® Community Plan. For any additional information or assistance, contact the Elk Creek Fire Protection District at 303-816-9385.

Elk Creek Fire Protection District Programs

- [Community Chipping Program](#)- The Elk Creek Fuels Module is available to help chip slash throughout the district. Guidelines and a registration portal are located on the website.
 - <http://elkcreekfire.org/chipping-program/>
- Home Assessment Program – The Elk Creek Wildfire Specialist is available to perform an in-depth home assessment of properties throughout the district. In order to schedule, call 303-816-9385 ext. 25.

State and National Programs

- [Institute for Business and Home Safety Wildfire Research](#) – IBHS is a leading research facility with helpful videos and [construction best practices](#).
 - <https://disastersafety.org/wildfire/ibhs-wildfire-research/>
- [Community Planning Assistance for Wildfire](#)- CPAW works with communities to reduce wildfire risk through improved land use planning across the country. The website has great research and best practices from communities across the country.
 - <https://planningforwildfire.org/>
- [Colorado State Forest Service](#)- CSFS provides a number of publications that can be useful to the community and individual homeowners.
 - <https://csfs.colostate.edu/csfspublications/>
- [U.S Fire Administration](#)- USFA provides a Wildland Urban Interface toolkit to help guide planning and outreach to residents
 - https://www.usfa.fema.gov/wui_toolkit/wui_outreach.html

Networks

- [Fire Adapted Communities Learning Network](#) – Fire Adapted Communities is a national network of practitioners and communities that discuss best practices in implementing fire resilient landscapes.
 - <https://fireadaptednetwork.org/>
- [Fire Adapted Colorado](#) – FACO is network of Colorado communities and practitioners focused on creating more resilient communities.
 - <https://fireadaptedco.org/>
- [Fire Adapted Bailey](#) – Fire Adapted Bailey is a local nonprofit working group focused on wildfire mitigation in north Park County.
 - <https://www.fireadaptedbailey.org/>

Endnotes

- ⁱ Mark A. Finney, C. W. (2003). *Hayman Fire Case Study*. Missoula, Montana: United State Forest Service RMRS. Pg. 1. https://www.fs.fed.us/rm/pubs/rmrs_gtr114/rmrs_gtr114_059_095.pdf
- ⁱⁱ Colorado State Forest Service. (2019). *Risk Summary Report*. Colorado State Forest Service. P.g 45.
- ⁱⁱⁱ Colorado State Forest Service. (2019). *Risk Summary Report*. Colorado State Forest Service. P.g 48.
- ^{iv} Colorado State Forest Service. (2019). *Risk Summary Report*. Colorado State Forest Service. P.g 52.

References

- Mark A. Finney, C. W. (2003). *Hayman Fire Case Study*. Missoula, Montana: United State Forest Service RMRS.
- Colorado State Forest Service. (2019). *Risk Summary Report*. Colorado State Forest Service.